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JOB PERFORMANCE OF YOUNG WORKERS IN RELATION TO SCHOOL BACKGROUND, A PILOT APPROACH TOWARD USING THE JOB ENVIRONMENT IN EVALUATING BOTH GENERAL AND VOCATIONAL EDUCATION.

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DESCRIPTORS- *VOCATIONAL EDUCATION, *HIGH SCHOOL GRADUATES, *GENERAL EDUCATION, *PERSONNEL EVALUATION, PROGRAM EVALUATION, COMPARATIVE ANALYSIS, MALES, GRADES (SCHOLASTIC), EMPLOYMENT LEVEL, PILOT PROJECTS, INDIVIDUAL CHARACTERISTICS,

THE PURPOSE OF THIS STUDY WAS TO EXPLORE WAYS OF USING THE WORK ENVIRONMENT TO APPRAISE THE EFFECTS OF PREEMPLOYMENT EDUCATION -- BOTH GENERAL AND VOCATIONAL EDUCATION -- ON SUBSEQUENT JOB SUCCESS. DATA WERE COLLECTED FROM AUGUST 1964 TO MAY 1965, AND CAME FROM THREE PRIMARY SOURCES -- (1) TELEPHONE INTERVIEWS WITH 150 BOYS WHO GRADUATED FROM THREE DIFFERENT TYPES OF HIGH SCHOOLS IN 1963 BUT HAD OBTAINED FULL-TIME WORK INSTEAD OF CONTINUING THEIR FORMAL EDUCATION, (2) THEIR OFFICIAL SCHOOL RECORDS (CLASS RANK, GRADES IN ENGLISH AND VOCATIONALLY-ORIENTED SUBJECTS, ATTENDANCE RECORDS, AND SCORES IN INTELLIGENCE AND THE DIFFERENTIAL APTITUDE TEST), AND (3) THE EMPLOYERS OF THE 150 BOYS WHO WERE INTERVIEWED BY THE INVESTIGATOR AT 123 PLACES OF EMPLOYMENT. EACH EMPLOYER DEFINED THE JOB AS BEING ON ONE OF FOUR LEVELS OF DIFFICULTY, AND INDICATED THE ORDER OF IMPORTANCE OF THREE CLUSTERS OF CHARACTERISTICS -- (1) COMMUNICATION COMPETENCY (VALUED MOST IN 42 CASES), (2) PERSONAL ADEQUACY (VALUED MOST IN 91 CASES), AND (3) SKILLS UNIQUE TO THE JOB (VALUED MOST IN 17 CASES). BOYS FROM ALL THREE SCHOOLS WERE EQUALLY SUCCESSFUL IN OBTAINING JOBS RELATED TO THEIR TRAINING. ALTHOUGH NO SIGNIFICANT RELATIONSHIP EXISTED BETWEEN CLASS RANK IN SCHOOL AND RANK ON THE JOB, THE POOREST FOURTH OF GRADUATES HAD SIGNIFICANTLY POORER EVALUATIONS ON EVERY MEASURE OF JOB SUCCESS. (SL)

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A Study Sponsored by the
EDUCATIONAL RESEARCH AND DEVELOPMENT COUNCIL
of the Twin Cities Metropolitan Area, Inc.
College of Education, University of Minnesota
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EDUCATIONAL RESEARCH AND DEVELOPMENT COUNCIL
of the Twin Cities Metropolitan Area, Inc.

College of Education • University of Minnesota • Minneapolis, Minnesota

April 30, 1966

Director
Office of Manpower, Automation, and Training
U.S. Department of Labor
Washington, D.C.

RE: Contract No. 81-22-30

Sir:

Reported herein are the results of a study initiated and conducted by Howard E. Bergstrom, Project Coordinator with the Educational Research and Development Council. Data were collected from August 1964 through May 1965, and the analysis and follow-up study were completed under contract with OMAT since June 1, 1965.

The purpose of the study has been to explore ways of using the work environment to appraise the effects of pre-employment education--both general and vocational education--on subsequent success of performance in the world of work. The field of the study would more accurately be personnel psychology than vocational education, although these are interwoven and interdependent fields.

The careful reader of Dr. Bergstrom's report will find that some fundamental challenges have been made to certain widely-accepted beliefs. These challenges would require large-scale research and program development to determine their worth. What has been established in the present study, we believe, is that the challenges are shown to have grounds for presentation.

The more tangible outcome of the study is the development of some techniques for evaluating young workers which might reflect on the school curriculum. As is appropriate in a pilot study, these methods are not finished instruments but may be useful to other researchers in developing refined techniques in specific occupational fields.

The colored-page section of this report presents an overview in non-technical terms, followed by the detailed technical report on white pages. We present this study in the hope that it may make a contribution toward current thinking and toward additional studies with similar objectives.

Sincerely yours,

Van D. Mueller
Executive Secretary

ACKNOWLEDGMENTS

Research in human affairs is always a joint effort, even when one individual actually carries out a project. The following organizations and individuals must be specifically mentioned in connection with the study reported in this volume, at the risk of omitting some whose contributions were also very valuable.

Administrators and counselors in more than 15 schools and school districts provided information, with most data obtained from Roosevelt and Vocational senior high schools in the Minneapolis Public Schools, and from the Robbinsdale Senior High School, Robbinsdale, Minnesota. Counselors Michael Davies, Donald Hanson, and Douglas Hanson conducted the telephone interviews with the graduates.

One hundred and sixty-one employed former students who graduated from the named high schools in 1963 were interviewed; the cooperation of these young men is greatly appreciated.

Executive and supervisory personnel in 123 places of employment in Minneapolis and surrounding areas granted interviews and provided information.

Several members of the Graduate School faculty of the University of Minnesota, Professors Gordon M. A. Mork and Cyril J. Hoyt in particular, have been consulted on the design of the study and the writing of the report herein.

The Educational Research and Development Council, through its Board of Directors, Commissions, and staff, has been the primary sponsor of the research. Executive Secretary Van D. Mueller and Associate Executive Secretary Donald E. Davis have been especially helpful, and Linda Kabrick typed the entire report.

The Office of Manpower, Automation, and Training, U.S. Department of Labor, has supported the study since June 1, 1965.

The writer could not have completed the project without the cooperation of his wife, Jane C. Bergstrom, to whom this volume is gratefully dedicated.

Howard E. Bergstrom

Minneapolis, Minnesota
April, 1966

OVERVIEW OF THE PROJECT

The Overview of the Project, presented on the colored pages preceding the study proper, has been prepared to provide the reader with a setting from which to view the problem and procedure of the study. Some of the insights and findings gained by the investigator are included as they seemed to bear on comprehension of the problem. An attempt has been made to write this section in non-technical terms.

* * * * *

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OVERVIEW OF THE PROJECT

Introductory Comments

The approach of this study may be of more significance than the findings. While the findings appear to have validity related to high school graduates who work after leaving grade 12 in the Minneapolis area, it is not known that the conclusions would apply to other metropolitan areas or to graduates of post-high school educational programs. Somewhat different findings would be expected especially if a similar study were to be conducted on graduates of post-high school programs involving rigorous technical training and selected students.

Therefore, the reader is invited to consider the approach of the study--to the development of a generalizable technique for defining the essential elements of job performance, to the evaluation of individuals on these essentials, and to the relationship of jobs to school background--as being the aspect which may have value in acquiring insights and in planning for further research.

Problem and Purpose

What is known about validating curriculum?

Research evidence makes it clear that success in college can be partially predicted from achievement records in high school. But success at another level of education is not the primary criterion on which one may validate school experience. Such a criterion may be helpful, but the ultimate application of schooling is "life."

Evidence that certain patterns of schooling or certain levels of academic achievement affect "life" is almost non-existent. It is not difficult to discover that people who go to college make more money, but then one must not fall into the trap of thinking that the money is always directly attributable to the education. Boys who eventually take over their fathers' businesses or get well-paying jobs working for relatives would usually have done so whether they attended college or not.

Furthermore, there is little evidence to show in most cases that the amount and type of education received is entirely necessary;

almost every job has successful practitioners who learned their skills on the job rather than in school, and in these instances schooling serves primarily as a screening and selecting process and only secondarily as a substitute for on-the-job training. (Jobs where initial proficiency is necessary to protect the health or welfare of people to whom services are rendered would not be subject to the foregoing generalization, and are usually not open to research on alternatives.)

Three areas in which schools have a legitimate concern are: outcomes involving occupations, success in social relationships and civic responsibilities, and the fulfillment of intellectual and artistic potential. Most of what is known about relationships between schooling and outcomes in the above areas is in the form of discoveries that high achievement in school has a positive relationship to whatever outcomes can be measured objectively. The degree or extent of this relationship is usually quite low, however, and in most cases cannot be established as a cause-effect relationship. "What makes people what they are" is such a complex phenomenon that education cannot be given credit in any specific manner.

What one studies vs. how well one does afterward

It may be concluded from numerous studies that students' chances of getting high grades in college are much better if they have gotten high grades in high school. But, no differences can be traced to or associated with the kinds of subjects taken.

Many colleges deny admission to those who haven't had a prescribed background in certain subjects, such as in mathematics or foreign languages. In a parallel way, many personnel departments in business and industry bar from employment those applicants who haven't taken prescribed vocational or technical courses. Research in colleges demonstrates that subject matter requirements for entrance to college bar as many superior students as inferior ones. It may be reasonable to assume that a similar situation exists in beginning levels of employment.

When an employer will look only at applicants with a specific background of training then he may find that the best of those who qualify do not have the potential of the best of those (who might also have applied) who do not have this training. The decision made is always a compromise between the employer's desire to get the best long-run employees and the need to cut down the costs of training new employees on the job. When trained workers are in plentiful supply it is logical to employ these first, if they have good training records.

For a number of reasons, personnel psychologists have never been able to obtain good results in testing relationships between training records and success on the job. The greatest difficulty is the "criterion problem"--nobody is sure what it is that should be included in "success." Next, even when criteria are decided on, they are so intertwined that a subjective rating by the supervisor is usually the best form of evaluation, and these give low reliabilities.

Complicating the matter still more is the difficulty of finding groups of workers, doing the same job under the same supervisor, which include enough workers to give a good statistical spread if they are ranked, and thereby be comparable to grades given to classrooms of students by teachers. Finally, the groups of co-workers tend to be quite similar in aptitudes and abilities because those who can't do the work get fired and those who are capable of a better job move up.

The job as a place to evaluate curriculum

Despite the difficulties in evaluating job performance, the attempt must continue to be made, because in no other way is it likely that school curriculum may be eventually tested and justified on an objective basis.

The job, as a major part of "life," must increasingly become a place where outcomes of education other than vocational skills are exercised. Intellectual and artistic fulfillment, and the meeting of social and civic responsibilities, are increasingly recognized as ends in themselves in the job environment. Owners and managers in business and industry recognize that the production of goods and the rendering of services for profit need not be their only concerns. Workers in each place of employment have legitimate rights to achieve some of their own life goals on the job, in addition to helping to achieve their employers' goals.

In the work-setting described above, one would not expect a worker to exhibit one set of values and behaviors on the job and a different set when away from the job. He can be a consistent organism, and education can attempt to prepare him to be consistent. Education toward effective communications and good human relations might then produce results observable in the work-setting.

Within this theoretical framework, it is reasonable to speculate that evaluation of behavior in the work setting can eventually help to evaluate the worker's school experience and achievement, not only in vocational education but in general education as well.

Only the job-setting provides the opportunity to evaluate the ultimate results of curriculum, since the home is generally out-of-bounds and "citizenship" is largely out-of-reach--of research. The job is a controlled situation. Most tasks are subject to measurement. Supervisors have the obligation to measure success, and they are increasingly becoming more highly trained and conversant with research techniques. It is not unreasonable to propose that in the forseeable future education will receive valuable guidance through studies which demonstrate both general and vocational outcomes in the work-setting.

Design and Procedures

The specific objectives of the study

The overall purpose of the study was to attempt to make a contribution toward evaluating the senior high school curriculum through testing relationships between measures of school achievement and aspects of graduates' satisfactoriness on their first full time jobs. Measures of school achievement used were those already accessible in any school. More specific objectives might be listed as follows:

a) A technique was to be developed for simplifying the definitions of jobs available to entry-workers in a metropolitan area. This involved asking supervisors to rank the importance of personal qualities, basic literacy, and "skills unique to the job" for each job studied. Employers also classified each job on how demanding it was of the workers' abilities.

b) The predictive potential of various measures of school achievement was to be tested, as these measures might relate to supervisors' rankings and ratings of the workers on the job-factors.

c) An attempt was to be made to discover whether or not the satisfactoriness of workers could be related to the pattern of subjects taken in school, or to the school attended, if other factors were equal.

The sources of data

Data used in the study came from three primary sources. First, each boy from the 1963 graduating roster who was seemingly eligible to be in the study was telephoned by a guidance counselor from his school and engaged in a structured interview. The place of work was recorded, along with the dates of starting and ending specific jobs, the supervisor's name, and other items. Second, the investigator gathered from the official school records the class rank, grades in English and vocationally-oriented subjects, attendance record, and scores in intelligence and the Differential Aptitude Tests. Graduates were classified "vocationally-oriented" or "general" according to the pattern of courses taken. Third, the employers of 150 boys were interviewed personally by the investigator, at 123 places of employment.

The Subjects. The group of 150 boys which was studied was thought to represent a "type" which has not received much attention in research. They were not school dropouts; they did not go on to college or other post-high school training; they did manage to get and keep full time jobs. They tended to have average intelligence and aptitude test scores, below-average English grades, and a wide range of grades in vocationally-oriented courses. A necessary condition for interpreting the study was to demonstrate that, as groups, boys who work directly out of high school will have the same characteristics regardless of the school graduated from. This started as an assumption which was tested in the first stage of the study, and was found to be true for the three schools selected. The rationale of this finding is that even when the total graduating classes of schools are quite different in composition, these differences are erased when the dropouts, the unemployed, those in post-high school education, and those working through "connections" are removed.

The Schools. Three schools were selected, one from each of three major metropolitan types: urban vocational, urban comprehensive, and suburban comprehensive. Only one vocational high school was available in Minneapolis, and the comprehensive schools were selected because they had the largest enrollments in the area. The numbers of students who met all criteria were surprisingly small, so that no sampling of graduates within schools was necessary. The three schools, in a sense, were a sample of all schools, and 1963 was a sample of all graduating classes. Fifty-five of 291 qualified from the vocational school, 51 of 669 qualified from the urban comprehensive school, and, 44 of 758 qualified from the suburban comprehensive school (total classes included girls, who were not studied). Because the graduates by school groups were equal (no significant differences) in aptitude measures and attendance records, individuals were assigned standard scores in English, vocational, and total grade averages according to their standing in their own school-groups.

The Employers and Jobs. The 123 places of employment, with as many as four separate job-settings in some places, provided a crosssection of jobs actually open to boys just out of high school. Personal visits were made to each place, and oral interviews were conducted with supervisors of the 150 subjects--often with both a company personnel director plus a supervisor. The personal interview was thought to be necessary because of the importance of a high return, the sensitiveness of the topic, and the great range of personalities with whom it was necessary to achieve rapport.

The Sequence of Procedures

a) The criteria for selection of subjects were applied to the members of the 1963 graduating classes of the three schools. The subjects, thus selected, were interviewed by telephone; 183 were interviewed and of these 161 were found to qualify on the selective criteria. Data were gathered from school records on these subjects.

b) Employers of the 161 subjects were contacted by letter and telephone, and 123 places of employment were visited, resulting in interviews which produced data for 150 subjects. The subjects were ranked and rated with comparable co-workers and the jobs were defined by "content" and "demandingness."

c) School achievement measures, attendance, and ranks assigned workers by their employers were converted to approximate standard scores--in one-digit form for convenience of computation and presentation. Classification by school program taken, and the job content and demandingness, were also reported in one-digit form.

d) Chi-square tests of the relationships between various combinations of elements of the three basic sets of variables were computed. The variables were: (1) potential predictors (school achievement, attendance, and program taken); (2) the criteria for relating school experience with work experience (job content and demandingness); and (3) the evaluations of graduates-now-working (rankings on satisfactoriness and ratings of satisfactory or unsatisfactory).

e) A group of 90 co-workers was compared to the 150 principal subjects. The purpose of this comparison was to discover if the principal subjects and co-workers were alike as groups. However, an unpredicted bias in selection of co-workers, by employers, made the usefulness of the comparison questionable. Another comparison made at the conclusion of the study was between the principal subjects who were most "carefully" recruited and selected compared to those most "carelessly" recruited and selected.

Findings and Interpretations

What kinds of jobs were available to the graduates?

The findings which follow provide an approximation of the range and frequency of jobs open to high school graduates without further training--at least in the Minneapolis area. Of the 150 boys studied intensively: 12 were in high-skill, white-collar jobs; 11 were in high-skill, blue-collar jobs; 10 were sales clerks or service station attendants; 36 were stock or shipping clerks; 12 were in driving or delivery jobs; 14 were semi-skilled machine operators; 16 were in assembly, fabrication, or inspection; 11 were custodians or hospital orderlies; 12 were in public accommodations such as food services; and, 16 were miscellaneous unskilled laborers.

What did employers value most in their employees?

All 150 jobs were "defined" by employers as fitting into one of four levels of "demandingness," and also were defined by indicating the order of importance (to each job) of three clusters of characteristics: (1) Communications Competency, (2) Personal Adequacy, and (3) Skills Unique to the Job. In 91 of the 150 instances, "Personal Adequacy" was valued most. "Communications Competency" was valued most in 42 cases, and "Skills Unique to the Job" were valued most in only 17 cases. Where "Personal Adequacy" ranked first, "Communications..." ranked second in 50 cases and "Skills..." ranked second in 41 cases. Perhaps the results are not surprising when one considers that only 23 of the 150 boys were in jobs rated as "high skill." However, it is clear that vocational training must continue to stress training in communications and personal characteristics along with skills.

Which boys got (and kept) which jobs?

Boys from all three schools were equally successful in obtaining jobs related to their training; however, since a greater proportion from the vocational school _had_ training, more got related jobs. The _demandingness_ level of jobs did not differ significantly by schools. Demandingness was clearly related to achievement, however, in that significant findings were obtained for class rank, English grades, and vocationally-oriented grades--attendance did not show a significant relationship in this context. It is also worthy of note that workers rated "Unsatisfactory" did not necessarily lose their jobs. From three to 12 months after starting their jobs, 42 out of 150 were rated as those the employer would "as soon not rehire," yet most of these had passed a probationary period and would not be dismissed.

What differences were associated with selection procedures?

When the 48 "carefully selected" workers were compared with the 43 "carelessly selected" workers, a few interesting results were noted. First, the "careless" hiring tended to be done by the owners themselves, while the "careful" hiring was usually done by employed managerial personnel. "Careful" selection was recorded as often for general graduates as for vocationally-oriented graduates, and as often for one school as the others. "A" students in vocational courses tended to be more "carefully selected," as they also tended to have the best jobs, but English grades and attendance record seemed to make no difference.

What seemed to predict success on the job?

The parallel between grades in school (ranks) and ranks on the job was not generally supported by the findings. Perhaps the groups of workers were too small and too well-placed according to ability for relationships to school achievement to occur. Or, perhaps the "school situation" in general is too different from the "work situation" for clear relationships to be present.

There were two exceptions to the general lack of significant relationships. The "D" students in vocationally-oriented courses, from both types of schools, got lower evaluations even though they were working among less competent co-workers. (This occurred only in the "Skills..." evaluation, and not in the others.) A much clearer finding, it should be noted, concerned the attendance record. The poorest fourth of the graduates in attendance (in general, those who were absent and/or tardy 50 to 100 times in three years) had significantly poorer evaluations on every measure of job success.

How may the study be useful as a "pilot approach"?

The method of defining jobs on a grid, with "demandingness" on one axis and "job content" on the other axis, may be useful if further refined. The advantages of generalizing these two components, instead of attempting to provide detailed definitions of thousands of jobs, are these:

a) Automation and rapid technological change necessitate adaptability of workers (perhaps each square on the grid can represent a "family" of jobs within which a worker could easily adapt because they are fairly equal in difficulty and emphasize the same characteristics, even though their titles and detailed descriptions might sound very different);

b) Follow-up studies show that as many as half of all trained workers do not get placed or retained in a job they were trained for (perhaps the more generalized definition, and a more generalized training, would provide for better utilization of training).

A number of other features of the study may have pilot utility, especially the method of obtaining evaluations from the employers.

An Invitation to the Reader

Readers with more than a casual interest in the topic of this study may wish to have their attention drawn to certain parts of the detailed report which will illuminate some of the concepts to which reference has been made in this Overview. A few of these special references are:

(1) The research on validating curriculum is reviewed in Chapter II.

(2) The "grid" for defining jobs is given as Figure 2. Explanatory text accompanies the figure.

(3) The complete design of the study is given in Chapter III. Figure 4 illustrates the test of the central hypothesis.

(4) A more thorough summary of interpretations appears as the last major section of Chapter IV. See all of Chapter IV for the complete findings.

JOB PERFORMANCE OF YOUNG WORKERS
IN RELATION TO SCHOOL BACKGROUND:

A Pilot Approach Toward Using the Job Environment in Evaluating Both General and Vocational Education

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CHAPTER I

INTRODUCTION

Purpose and Limitations of the Study

Purpose

The general problem on which the present study is focused is that of establishing better predictive relationships between high school experience and subsequent success in post-high school employment.[1]

Better means of prediction would be useful in strengthening curriculum and in improving vocational guidance in secondary schools. The format of some sections of the study may have applications to similar analyses of data on graduates of post-high school programs.

Limitations

The present study has been conducted for the purpose of exploring numerous interrelated facets of the problem of education and employment. The upper limit of expectation regarding outcomes was that certain contentions or hunches might either be shown to lack support in the findings or be reinforced to the level of hypotheses worthy of further testing.

Outline of the Problem

The problem in its broader context

Although the specific problem of the present study is restricted by several conditions, the broad context of the larger problem from which it stems may be outlined as a matter of interest and perspective.

The problem of finding relationships between educational background and subsequent employment presents an immense arena for research. The assumption which offers the greatest theoretical difficulty is the assumption that education, or vocational education in particular, is a cause, and employment, or success in employment, is an effect. But research on a cause-effect relationship faces almost insurmountable difficulties, chiefly because the elements of vocational success are so diffuse and the factors which have made a person what he is--home, school, church, peer group, heredity, etc.--are also diffuse. Therefore, the present study focuses entirely on predictive relationships, not cause-effect relationships.

---

[1] References to related research and other literature are found primarily in Chapter II. References in other chapters are footnoted only when a notation is made to a unique source.

The focus of research has been the "criterion problem." Investigators have not arrived at agreements on what criterion or criteria should be used for evaluating performance adequacy on jobs. Supervisors' judgments have been used most commonly as the source of ratings or rankings of the total or overall satisfactoriness of workers. However, attempts at breaking the total into sub-factors have been based on conflicting premises and the results are inconclusive.

The problem in a more restricted context

The subjects of the present study all managed to obtain jobs, without help from relatives or from special federal programs for the unemployed. They graduated from high school without special inducements. Therefore, it is logical to suppose that dropouts and the unemployed, through special efforts in training and placement involving the new federal programs, will cause some young people with characteristics similar to those of the subjects of the study to be "displaced by" (placed instead of) people with possibly less aptitude and initiative.[1]

The problem of the study may be viewed as having three sequential parts. First is the matter of deciding on criteria of satisfactoriness in jobs and of school background which might evidence relationships. Second is the matter of devising a means of obtaining evaluations of work performance which can logically be tied to potential predictors in the school background. Third is the difficulty of making a case for actual predictive relationships between single factors, where relationships might be found, inasmuch as the causal relationships are extremely complex and not subject to analysis through existing means.

Figure 1 provides a partial illustration of the approach taken in the study in regard to establishing criteria of satisfactoriness. It also illustrates the procedure by which the jobs were arbitrarily "defined." (The abbreviations in Figure 1 are spelled out and explained in the section on Definitions of Essential Terms which appears in the present chapter.)

---

[1] Both groups "deserve" jobs equally. The question here is simply that one group may suffer because the attention is focused primarily on another group.

FIGURE 1

DEFINITIONS OF JOBS ACCORDING TO
CLASSIFICATION BY DEMANDINGNESS AND
THE RANKED IMPORTANCE OF THE JOB-CONTENT FACTORS

		Job Content Factors					
		CPS	CSP	PCS	PSC	SCP	SPC
Demandingness	4 (more)						
	3						
	2						
	1 (less)						

The measurement problem

Many obstacles are in the way of precise or even approximate measurement of the factors which must be controlled if the relationships between school experience and vocational success are to become clear enough so that specific recommendations for curriculum or guidance may be justifiably made. No attempt has been made in the present study to actually overcome these obstacles other than to contrive some measuring devices which are here hopefully presented as being adequate to discern strong relationships, but which are not thought to be sophisticated enough to measure the extent of these relationships.

The chief obstacles to precise measurement are summarized below:

a) Research to date is not clear on what are the criteria of success, or satisfactoriness, of workers on the job. It is clear only that the criteria used in research are more or less arbitrarily defined by each researcher, and that various criteria have assumed the dominant position at different times in the history of the research.

b) Even when the criteria for judging satisfactoriness have been arbitrarily established, the problem of measurement is extremely difficult. Super concludes that the subjective evaluations by supervisors, despite their low statistical reliabilities, are the most defensible source of evaluations.[1]

c) In the schools, the foremost obstacle to the measurement problem is the uncertainty about which courses or subjects result in which outcomes. If the view is taken that any particular outcome is likely to be the product of experiences in more than one course, plus out of school experience, then the matter of deciding on curriculum change is indeed difficult.

d) Also a serious problem for education is the determination of what school "achievement" is and how it can be measured. Ideally, achievement should probably be equated with learning, and be most validly measured as outcomes in out-of-school and post-school life, by ascertaining what transfers of learning or behavior changes had taken place. The measures of achievement used in this study consisted of averages of letter grades assigned in sequences of courses, plus the record of attendance in grades 10 through 12. This led to the problem of developing a general standard for equating letter grade averages from school to school when the meaning of a specific grade varies from school to school.

e) Even if all of the foregoing difficulties could be overcome, there would remain the question of whether the success an individual might achieve on a particular job is success on the level of job which represents an optimum challenge to the individual, representing productivity commensurate with his capacity.[2] This difficulty level or "demandingness" of the job represents another dimension which must be measured and taken into account in comparing school achievement with success or satisfactoriness of workers on the job.

---

[1] Super, Donald E. "The Criteria of Vocational Success." Occupations, 30: 5-9; October 1951.

[2] The concept of "job difficulty level" will be termed "demandingness" in the remainder of the study, meaning how demanding the job is of the person's abilities, roughly quantified by a classification hierarchy of four levels.

Evaluating the effectiveness of local school programs

The primary or general problems outlined above are supplemented by others, which, if studied through analysis of local data, can have mainly local significance. Certain questions point up the possibility of problems with local applications. For example, are too many boys of low potential for filling "more-demanding" jobs nevertheless obtaining these jobs because they happened to receive certain training programs--and are they then failing to meet the demands of these jobs? Or, don't they get these jobs? If not, do they succeed as well on the jobs they do get as they would have if they had received more general education in place of vocationally-oriented education?

Background Dimensions

A concept of curriculum

A general concept of curriculum was arbitrarily adopted for the theoretical basis of the present study. This concept includes the point of view that the objectives of almost all curricula of public secondary schools can be logically categorized into: (1) preparing young people for the world of work; (b) helping individuals reach intellectual and artistic fulfillment through the liberal arts and sciences; and (c) providing experiences designed to help young people meet home and civic responsibilities.

Typically, a school subject or course is perceived as having one of the foregoing curriculum goals as its prime target. The contention held in the present context, however, is that only through a case study approach might one hope to determine the actual outcomes of any particular subject or course as it may have influenced a number of individuals who were involved as students.

That is, a case can be made for saying that English or biology can apply as readily, though perhaps not as frequently, to young people's occupations or citizenship as to their intellectual fulfillment. Or, social studies or homemaking can apply as readily, though perhaps not as frequently, to work or to intellectual fulfillment as to home and civic responsibilities. Or, bookkeeping or auto mechanics can apply as readily, though perhaps not as frequently, to meeting citizenship responsibilities or to developing intellectually as to preparing for the world of work.

To summarize: the definition of curriculum adopted as a base for the present study centers on the idea that the outcomes of most courses scatter widely, and that to trace and measure these outcomes would be exceedingly difficult. However, if the performance of students, in subjects or courses which are logically connected to areas of performance in jobs, is taken to be a predictor of success in these areas and not necessarily the source or cause of success, then a reasonable basis for discovering meaningful relationships has been established.

Vocational education and "vocationally-oriented" courses

Of the three goals of public secondary education arbitrarily defined above, only preparation for the world of work was used as an area of evaluation in this study. Furthermore, the evaluations consisted of employers' subjective rankings and statements only. The context of study was therefore limited.

A background statement on vocational education and "vocationally-oriented" courses is offered as part of a rationale for defining arbitrary criteria on which the job-success evaluations were made. The assumption is that most courses in a senior high school program of vocational education (as defined by qualifying for support under the "Smith-Hughes" program, for example) do not differ significantly, especially in terms of observable outcomes, from courses in a general education program which are "vocationally-oriented."

That is, a course in either bookkeeping or auto mechanics, at the high school level, will have basically the same observable outcomes whether it is specifically a vocational course or a "vocationally-oriented" course in a general education program. Theoretically, a vocational course will include learnings which can be applied immediately to performance of paid work, while a general education course with the same name can be "pre-vocational," emphasizing basic or broad skills. In fact, however, there is a wide overlap, with many vocational courses providing instruction with antiquated methods or machines and many "non-vocational" courses employing the latest in methods and machines. This, at least, is the assumption. It was partially tested in the course of the study.

The objectives of either vocational courses or "vocationally-oriented" courses are not limited to specific skills and technical knowledge. Personal characteristics are developed in these courses, as are competencies in the basic academic skills, particularly in ways which apply to the total performance of a job; for example, communications skills learned in a shop course might better apply to the performance of a job than might the parallel skills learned in an English course.

No further differentiation between "vocational" education and "vocationally-oriented" education has been made in this manuscript. The assumption is that "vocationally-oriented" covers both concepts.

Trends in criteria of job-success

Until the 1930's and 1940's, the most common criterion of job-success was output. If a worker received fixed wages or salary, the employer was interested chiefly in receiving output worth more than the wages plus materials and overhead costs, so that a profit would result. If the worker received piecework remuneration, the employer was also interested in output so that a minimum number of working stations (space, tools, etc.) would be needed to achieve the volume of production desired.

The development of automated and semi-automated means of production has placed the emphasis of control of output on the machine rather than on the man. Especially in production jobs requiring little skill, either the worker keeps up with the machine, and nothing more is desired or possible, or he doesn't keep up, whereupon he cannot perform the job satisfactorily. In jobs which are still dependent on the speed of hand operations, most involve union contract regulations or informal agreements concerning the quantity of output. Output remains as an important factor in clerical, managerial, professional, and some service occupations, few of which are involved in the present study.

Output was not used as a success (satisfactoriness) criterion in this study because of its de-emphasis as a job-success criterion--so that it figures prominently in only a minority of cases among unskilled and semi-skilled jobs. Instead, "Communications Competency," "Personal Adequacy," and "Skills Unique to the Job" were adopted as sub-criteria of "Overall Satisfactoriness." Length of tenure was not a criterion because the tenure at the time of the evaluation was 90 days, by definition. Wages were not considered, and promotions were not used because of their low incidence in a three-month period.

Trends in supervisory relationships

The relationship between the worker and his supervisor has also changed greatly. The age of the sweatshop produced the foreman or supervisor whose leadership was frequently expressed in harsh or even abusive terms. The change in behavior of the typical supervisor has been drastic, as a result of the union movement along with the growth of enlightened human relations attitudes of management. Other influences for change have been labor shortages, during World War II and at other times, as well as basic research in the industrial relations field.

It is a general hypothesis of this study that the prevailing relationship between supervisors and young workers recently out of high school is enough similar to the relationship between senior high school students and their teachers so that this similarity will be reflected in tests of significance of the relationship between letter grades assigned in high school courses and ranks or ratings assigned subsequently by job supervisors.

Definitions of Essential Terms and Concepts

Comprehension of the analysis and interpretations in the present manuscript will be aided by definitions of terms and concepts which may be used in special or arbitrary ways in this study. Some of these definitions are included in the foregoing section, "Background Dimensions." Others are provided more briefly, below:

Entry jobs. These are defined as the jobs actually obtained as first full time jobs by the principal subjects of the study, and held for more than 90 days. These roughly approximate the range and distribution of entry-jobs such as those compiled by the U.S. Bureau of Manpower Utilization,[1] but no attempt was made to structure the classifications except in terms of the common-sense categories noted in Table 1. Table 2 is based on the 1960 U.S. Census.

The principal subjects. The principal subjects are defined as all male graduates of the 1963 classes of the three selected high schools who met the criteria which were set up to make the groups sufficiently similar for comparative purposes. The "principal subjects" are thus distinguished from the "comparable co-workers" who were also evaluated by the job supervisors.

"Job-situation." The unit of evaluation was the "job-situation." This was not the place of employment but rather referred to the group of comparable co-workers under the same supervisor who were doing approximately the same work. Some places of employment had two or more job-situations in the study.

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[1] Bureau of Manpower Utilization, "Entry Occupational Classification," Part IV of Dictionary of Occupational Titles. Washington: U.S. Government Printing Office, 1944.

TABLE 1

JOBS IN THE STUDY ACCORDING TO TEN ARBITRARY CLASSIFICATIONS

Job Classification	Number	Percent of Total
High skill, white collar (drafting, layout, etc.)	12	8.0
High skill, blue collar (mechanic, repair man, etc.)	11	7.3
Sales clerk (incl. service station attendant)	10	6.7
Stock clerk--shipping, receiving shelving, etc.	36	24.0
Driving, delivery (some in combination with clerical and janitorial)	12	8.0
Machine operator	14	9.3
Assembly, fabrication, inspection	16	10.7
Janitorial, custodial, hospital orderly, etc.	11	7.3
Food service and related public accommodations	12	8.0
Physical labor (unclassified)	16	10.7
TOTAL	150	100.0

TABLE 2

NATIONAL EMPLOYMENT BY OCCUPATIONAL GROUPS--1960[1]

Occupational Group	Number (millions)	Percent of Total
Professional, technical and kindred workers	7.5	11.2
Managers, officials, and proprietors (except farm)	7.1	10.6
Clerical and kindred workers	9.8	14.7
Sales workers	4.4	6.6
Craftsmen, foremen, and kindred workers	8.6	12.8
Operatives and kindred workers	12.0	18.0
Service workers	8.3	12.5
Laborers, except farm and mine	3.7	5.5
Farmers, farm managers, farm laborers and foremen	5.4	8.1
TOTAL	66.7	[illegible]0.0

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[1] U.S. Department of Labor, Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization, and Training. Washington: U.S. Government Printing Office, 1963. Abridged from Table 28, p. 100.

"Comparable co-workers." The workers who did about the same work as the principal subjects did in each job situation were called "comparable co-workers." They were considered to be comparable if they were high school graduates without further pre-evaluation training, if they met the other criteria set up for selection of the principal subjects, and if they were evaluated at the end of the normal probationary period for the job in question. In the initial analysis the statements of the supervisor or personnel officer were considered to be adequate evidence of whether or not each co-worker was "comparable."[1]

"Content" of jobs. Three areas of job performance were selected as criterion factors for the supervisors to evaluate, on the assumption that each is a factor in the performance of almost every job and that together they "cover" the bulk of performance on most jobs. These content or performance factors are "communications competency," "personal adequacy," and "skills unique to the job." The content of each job was indicated by the ranking in importance of the three content factors--by the employer or supervisor.

"Demandingness" of jobs. Together with the ranking in importance of the job-content factors, "demandingness" completes the system of job definitions as used in this study. Four levels of demandingness, or difficulty of performance of jobs, were arbitrarily defined.

Satisfactoriness. The meaning of "satisfactoriness" of employees was limited to the evaluations made by the immediate supervisor of each subject on his first full time job. In this context, "success on the job" included only the "satisfactoriness" of the employee--not other aspects of work-adjustment such as satisfaction of the worker.[2]

---

[1] After the completion of the main body of the study, a validation check was made on a sample of "comparable co-workers," in which they were compared to the "principal subjects" on attendance, I.Q., and the Differential Aptitude Tests.

[2] Heron, Alistair. "Satisfaction and Satisfactoriness: Complementary Aspects of Occupational Adjustment." Occupational Psychology, 28: 740-53; July 1954.

Communications Competency. One of the three job-content factors in the job definition as used in the study was "communications competency." The operational definition presented to employers included: "Reading instructions and following them;" "Writing records, reports, receipts, etc.;" "Following instructions given orally;" "Talking with co-workers or customers as a necessary part of the job;" "Recording and using numbers (here considered to be a part of language or communication) as in making change, taking measurements, etc." (The phrase "basic literacy" might have been used instead of "communications competency.")

Personal Adequacy. The second of three job-content factors in the job definition was "personal adequacy." The operational definition presented to employers included: "Gets to work on time, hardly ever absent;" "Works to the best of his ability;" "Honest, and is loyal to his employer;" "Gets along well with other workers."

Skills Unique to the Job. The third job-content factor arbitrarily defined for the study was "skills unique to the job" (each job). The sub-headings presented to employers included: "Things everyone has to know how to do to hold this job;" "Operations or skills the worker has to learn either in school (vocational training) or otherwise time has to be spent to teach him on the job."

"General" high school graduates. Subjects were classified as graduating from either "general" or "vocationally-oriented" high school programs. Boys who had, in grades 10-12, one hour a day or less of "vocationally-oriented" courses (such as industrial arts, bookkeeping or distributive training) were considered to be "general" graduates (exceptions are noted in Chapter III). For example, the introductory year in any industrial arts field was considered to be a part of general education, unless the student had taken the second year in the same field.

"Vocationally-oriented" high school graduates. The graduates of comprehensive schools were classified as "vocationally-oriented" if they had completed eight or more semesters of courses in industrial arts, business education, or other fields where the counselor affirmed that job preparation was the foremost objective. A few graduates were classified as "vocationally-oriented" if they had taken only six or seven semesters of vocationally-oriented courses when this amount included the full offering in one specific field, such as four semesters of auto mechanics or four to six semesters of printing. Since all graduates of the urban vocational high school had 10 to 12 semesters in one vocational field, they were all in the "vocationally-oriented" classification.

School achievement. The measures of school achievement analyzed in this study were: (a) class rank in grade 12; (b) average of letter grades in six semesters of required English; (c) average of grades in vocationally-oriented courses. Attendance (d) was also analyzed, as a type of performance related to achievement.

"Sten" scores. All measures of achievement and other characteristics analyzed in this study which could be assumed to be normally distributed in the population were converted to approximations of standardized scores which could be handled conveniently in one-digit form. The "sten" formula ("standardized scores in tens") was employed to assign percentages of the totals in the distributions of values which could logically be assumed to be normally distributed.[1] The "sten" formula is similar to the more common "stanine" formula. The "sten" percentages are: 2%, 5%, 9%, 15%, 19% (median) 19%, 15%, 9%, 5%, 2%.[2]

Outline of Objectives of the Study

The present study was essentially a pilot study, designed to explore some techniques for defining jobs and evaluating young workers, to test the predictive relationships between school achievement and subsequent success in employment, and to reinforce or show lack of support for certain hypotheses which will require further testing.

Objectives which may have general applications

a) A technique was explored for simplifying the definitions of jobs available to entry-workers in a metropolitan area--which included classifying all jobs into priority orders of three content or performance designations, plus classification into four levels of how demanding the jobs are of a worker's abilities.

---

[1] Lyman, Howard B. Test Scores and What They Mean. Englewood Cliffs: Prentice-Hall, 1963, pp. 94-95.

[2] The extremes of this ten-point distribution were grouped in calculations of chi-square tests, in order to permit adequate frequencies to occur in all cells. As a result, a six-point scale actually was used, with values 1 and 2 grouped with 3, and with values 9 and 10 grouped with 8. (This was further reduced to a four-point scale in the case of the satisfactoriness ranks.) All, however, employ 5.5 as the median, with values of 3, 4, and 5 below the median, and with values of 6, 7, and 8 above the median.

b) The job-content areas were tried out as criteria for evaluating the job-success of young workers, through rankings of clusters of co-workers by their supervisors and testing for significant relationships.

c) The predictive potential of various measures of school achievement was tested, in a limited context, as these measures related to the evaluations of job-success or satisfactoriness.

d) Hypotheses for further testing were formulated, based on findings which resulted from the defined tests of relationships.

Objectives which have mainly local applications

a) An attempt was made to determine whether or not graduates who differ in school programs taken, but not in achievement, can be distinguished from each other, as groups, on the satisfactoriness rankings or ratings or on the content or demandingness definitions of jobs obtained.

b) The relationships among various descriptive data were explored (including data obtained from interviewing the graduates plus their employers).

Overview of Procedures of the Study

The procedures which were conducted in seeking the foregoing objectives may be outlined as follows:

a) Criteria for selection of subjects were applied to the members of the 1963 graduating classes of three high schools.[1]

b) The principal subjects of the study, thus selected, were interviewed by telephone;[2] 183 were interviewed, and, of these 161 were found to qualify on all selective criteria.

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[1] Criteria for selection of subjects plus descriptions of the three schools are given in Chapter III.

[2] A copy of the interview form appears in Appendix B.

c) Data were gathered from school records, which included the measures of achievement and attendance, an intelligence quotient, scores from a differential aptitude battery, and a listing of vocationally-oriented courses taken.

d) Employers of the 161 qualified subjects were contacted by letter and telephone, and the 123 places of employment were visited, resulting in interviews which produced complete data for 150 subjects. In the interviews, the subjects were ranked and rated with comparable co-workers and the jobs were defined by content and demandingness.[1]

e) School achievement measures, attendance, and ranks assigned workers by their employers were converted to approximate standard scores--in one-digit form for convenience of computation and presentation. Classification by school program taken, and the job content and demandingness, were also reported in one-digit form.

f) Chi-square tests of the relationships between elements of the three basic sets of variables were computed. The variables were: (1) potential predictors (school achievement, attendance, and program taken); (2) the criteria for relating school experience with work experience (job content and demandingness); and (3) the evaluations of graduates-now-working (rankings on satisfactoriness and ratings of satisfactory or unsatisfactory).

g) Tests were made to determine whether or not the recruitment and selection practices of employers might be reflected in various ways.

h) A group of 90 co-workers was compared to the 150 principal subjects on aptitude scores and attendance. The purpose of this comparison was to discover if the principal subjects and co-workers were alike, as groups. (An unpredicted bias in selection of co-workers, by employers, made interpretation of this comparison questionable.)

---

[1] Copies of the material sent to employers plus the interview form and the ranking cards appear in Appendix B. A listing of places of employment where interviews were completed appears in Appendix C.

CHAPTER II

REVIEW OF LITERATURE

Introduction to Chapter II

The research literature relevant to the present study was reviewed in association with three research topics, and, in addition, literature on the broader problem surrounding the study was surveyed in part. Because an exhaustive review of literature on all four topics would have been prohibitive, an attempt was made for each of the research topics (1) to identify one or two published bibliographical reviews which are recognized as authoritative, with special note made of synthesizing or concluding statements, and (2) to supplement the bibliographical reviews with special references to specific studies which tie in directly to the present study.

The four topics on which the review of literature was organized appear below.

a) Prediction of college success

b) Prediction of vocational success

c) School curriculum and job performance

d) Literature on the broader problem

Prediction of College Success

Prediction from course achievement

It is well-established in research literature that the best predictor of overall college success (grade average) is the high school grade average or class rank. Travers, in one bibliographical summary, stated that "... the evidence indicates that the best single measure for the selection of the college sutdent is his average grade in high school. Study after study has indicated that the average high school grade is a better predictor of college grades than either subject matter or psychological tests."[1]

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[1] Travers, Robert M. W. "Significant Research on the Prediction of Academic Success." In Donahue, Wilma T., *et al.*, (eds.) *The Measurement of Student Adjustment and Achievement*. Ann Arbor: University of Michigan, 1949, p. 154.

Garrett arrived at the same conclusion in another summary in which he noted in addition that the correlations between high school and college grades are relatively good (.50, more or less) when the students studied are from several high schools in attendance at several colleges. The correlations improve when studies follow graduates of one high school to several colleges, and they improve still more if only one high school and one college are involved.[1]

A more recent study may be noted as an indication that the pattern which had been documented thoroughly up to 1950 is still valid. In 1963, Giusti reported a typical pattern. 397 freshmen were traced back to their high school records, and grade averages were compared between high school and college, on the total average and on the averages by subject fields. The product-moment correlation between the totals was .477, with the .01 level of confidence for significance at r± .148. None of the subject averages predicted total college average as well as did the total high school average, although subject averages had higher correlations with the same subject in college.[2]

Garrett also compared the merits of using total grade average or class percentile rank. Reference was made to 12 studies and a conclusion was cited that the difference favored the grade average but was too small to be of consequence.[3] (Class percentile rank was used in the study reported in the present volume because it was the most accessible. Also, if grade averages had been used, the change to "stens" would have erased any difference.)

Prediction from pattern of courses

Other studies are cited in the review by Travers which pertain to predicting college success from the patterns of courses, or the emphases of curriculum. Many colleges require that entrants must have taken a certain number of credits in certain subject-matter areas. Travers refers to seven studies which show that " ... there is practically no relation between pattern of high school credits and success in college."[1] One study by Douglas reported that when colleges impose credit minimums in particular subjects they bar as many superior students as inferior ones.[2]

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[1] Garrett, Harley F. "A Review and Interpretation of Investigations of Factors Related to Scholastic Success in Colleges of Arts and Sciences and Teachers Colleges." Journal of Experimental Education, 18: 91-138; December 1949.

[2] Giusti, Joseph P. "Relationship of High School Curriculum Experiences to College Grade Point Averages." Educational and Psychological Measurement, 23: 815-6; Winter 1963.

[3] Garrett, *op. cit.*, p. 96.

Relationship to the present study

The prediction of college success from high school achievement is held to have some parallel features to prediction of success (ranked satisfactoriness) in employment from high school achievement. If parallel features in a study are valid as predictor constructs, and if the methods and instruments are adequate, it might be supposed that school achievement would tend to predict satisfactoriness in employment.

The prediction of college success from patterns of emphases of curriculum has not been reported in the research literature. Likewise, a study of whether or not a substantial number of vocationally-oriented courses taken will be likely to affect satisfactoriness in employment would not be expected to result in the finding of significant differences.

Prediction of Vocational Success

Difficulty of establishing "success" criteria

Just as college "success" may be determined only in part by college grades, vocational "success" may be appraised only in part by the parallel of college grades in employment--ranks in satisfactoriness which are assigned by supervisors. Bell and others describe the problem as follows:

> "One of the most perplexing problems in applying... (measurements to personnel settings) is that of measuring job success. Few jobs are sufficiently oriented toward individual production to permit quantitative measurement. Rate of pay also presents problems in

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[1] Travers, op. cit., p. 159.

[2] Douglas, H. R. "Selecting College Entrants." Journal of Higher Education, 3: 179-184; April 1932.

> that, often, it is not directly associated with the aptitudes required for successful performance in the basic job... As a result, most successful researchers have abandoned such measures in favor of some form of rating scale (completed by the worker's immediate supervisor) to estimate differing degrees of job competence."[1]

Super has summarized the history of criteria used in research on vocational success. He also concludes that rating forms filled out by supervisors constitute the most sound approach, in that job-success is a complex outcome with no convenient objective measure similar to grade average in college.[2] Relatively low reliabilities of these ratings, however, place a ceiling on the development of validity through subjective means.

Low reliability of ratings is not simply a matter of the raters' judgments being understandably approximate. Vagueness of criteria can range from the differences in raters' concepts of "Below Average" or "Above Average" to differences in interpretation of highly specific factors.[3]

Success has two major dimensions

A matter of social importance is that the worker's satisfaction with the job also has a large role in determining job "success." The orientation of research until after World War II had been largely based on production output or how well the worker pleased his employer. But a growing awareness had come about, to the effect that workers have certain rights in employment, to security and self-realization, and that employers are not autonomous in their ownership of property and means to production but are subject to certain controls from society as a whole.

This awareness is evidenced in the division of current research between "satisfaction" studies and "satisfactoriness" studies. Scott and others[1] have developed a definition which makes "work adjustment" the most inclusive term, with "job adjustment" as a phase of work adjustment focused on one job. Within either work adjustment or job adjustment are the two dimensions of success: "satisfaction" (of the worker) and "satisfactoriness" (to the employer).

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[1] Bell, Forest D., Hoff, Alvin L., and Hoyt, Kenneth B. "A Comparison of Three Approaches to Criterion Measurement." Journal of Applied Psychology, 47: 416-418; December 1964.

[2] Super, "The Criteria of Vocational Success," op. cit., pp. 5-9.

[3] Super, Donald E., and Crites, John O. Appraising Vocational Fitness (rev. ed.). New York: Harper and Bros., 1962, pp. 32-41.

Heron has been cited as a prime contributor in placing the satisfaction-satisfactoriness dimensions in perspective for research. He outlined this theory in connection with a study of bus conductors in which he attempted to reduce evidence of satisfactoriness to objective criteria, thus placing workers into gradations of satisfactoriness before presenting these placements to supervisors for subjective confirmation or disagreement.[2]

Within the dimension of satisfactoriness are sub-dimensions or criteria which can be abstractly dissected in several ways. Ghiselli has offered one analysis which identifies "static," "dynamic," and "individual" criterion-dimensions.[3] In the case of the effectiveness of a retail salesman, for example, a static dimension might be simply the volume of sales. A dynamic dimension might be illustrated by a young salesman selling mainly on energy and enthusiasm, but as he grows older he sells more with less work but more poise and skill and he has built up a clientele. The individual dimension is illustrated by a situation where a group of beginning workers are equally satisfactory but for different reasons: one secretary is a faster typist, but another is more accurate, etc.

Satisfaction and satisfactoriness are psychologically inseparable, in the worker, and each undoubtedly has an effect on the other in research findings, although means are not available to discern the interrelations. Means of evaluating both dimensions simultaneously were not found in the literature.

Satisfactoriness as a complex criterion

Ghiselli has criticized researchers for either assuming a simple criterion for evaluating satisfactoriness or giving equal weight to each of several criteria.[1] Balma has made a similar statement in the form of stating the problem and in encouraging research in the direction of "synthetic validity." Balma illustrates the validity problem as follows:[2]

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[1] Scott, Thomas B., _et al_. _A Definition of Work Adjustment_. Minneapolis: Industrial Relations Center, University of Minnesota, 1958.

[2] Heron, Alistair, _op. cit_.

[3] Ghiselli, Edwin E. "Dimensional Problems of Criteria," _Journal of Applied Psychology_, 40: 1-4; February 1956.

a) There are too few people on any one job to conduct traditional validation studies in the great majority of job situations.

b) Results are needed immediately and conditions change, making follow-up studies impracticable in most cases.

c) Learning takes place on the job and makes most results inapplicable to individuals.

d) There is a great variability in the content of jobs with the same title.

e) There is a constant change in the content of the same jobs.

f) The rate of introduction of new jobs is too rapid for most research to apply.

One more point might have been added, from Ghiselli's presentation: that workers on the "same" job in different companies vary widely because of recruiting and hiring differences, and therefore cannot be grouped in studies without controlling the differences.

Apparently, Ghiselli and Balma are calling for development of methods which are not dependent on stereotyped job content and defined performance elements which "cover" the job in question. The study reported in this volume was an attempt, in pilot fashion, to leave flexibility in the job content dimension and still provide for a limited and manageable number of choices. In particular, an attempt was made to devise a format of analysis to fit most jobs held by entry workers.

The approach taken in the series of recent studies by the Industrial Relations Center staff at the University of Minnesota is that "Satisfactoriness has more direct reference to the standardized set of work behaviors required of the employee than to the contribution of the employee toward the attainment of the employing organization's goals. Systematic methods of measuring the individual's contribution toward the attainment of the employer's goals have not as yet been developed."[1] A comprehensive review of the literature on the behavioral criteria relating to the "sets of work behaviors" has been published in another volume of the series of studies by the Industrial Relations Center.[2] Among the more than 50 studies noted in this review, findings were reported to the effect that: (1) no findings relate employee attitudes to performance on the job;[3] (2) performance has shown little relation to psychological measures of individual differences; (3) when using multiple criteria a major problem is criterion-reliability; (4) data obtained from personnel records in industry, especially when attempting to combine data from several companies, tend to correlate with data directly from workers at unsatisfactorily low levels.

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[1] Ghiselli, op. cit.

[2] Balma, Michael J. "The Concept of Synthetic Validity," Personnel Psychology, 12: 395-96; Autumn 1959.

A brief discussion of the literature on criteria of job success has been given by Super.[4] Thorndike and others are cited in reference to the conception of immediate, intermediate, and ultimate criteria. In the study reported in this volume, the ranking and rating of beginning workers in entry jobs should be considered as applying to criteria having some intermediate as well as ultimate characteristics, even though the intermediate designation usually is given to performance associated with a trial period. Immediate criteria would be the success in training, in this case the school achievement.

Status of theory concerning criteria

Researchers seeking objective and highly reliable situations in which to conduct research on job performance (such as those studied by Heron, Rothe, etc.) will find that few jobs lend themselves to this approach and these are rapidly giving way to automation. Therefore, the studies which have the clearest designs and outcomes are rarely applicable to practical situations.

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[1] Carlson, et al., op. cit., p. 6.

[2] Scott, et al., op. cit., pp. 40-50.

[3] Brayfield, A. H., and Crockett, W. H. "Employee Attitudes and Employee Performance," Psychological Bulletin, 52: 396-424; September 1955. An observation made was that, theoretically, attitudes need not be related to performance unless more intrinsic goals of the worker are achieved through high performance.

[4] Super, Appraising Vocational Fitness, op. cit., pp. 31-41.

Personnel research in the military services emphasizes supervisors' subjective evaluations, because behavior in a disciplined inter-personal situation is the ultimate criterion rather than objective output. But in other ways the research conditions are superior to civilian situations, because of the direct relationships and single administration over both the training and performance situations, and the highly-defined assignments and relatively uniform background of supervisors. In spite of these advantages, however, Kipnis and Glickman have written that the U.S. Navy has not had much success in validating the predictors of the supervisors' evaluations. These predictors have usually been assumed to be the attrition and achievement levels in Navy technical training schools.[1] In comments on U.S. Navy personnel studies in general, Bechtoldt states about achievement grades, that "grades at their worst have been found to lack all the qualities of an acceptable criterion. Even in the best schools, grades lack one or more of these (the essential) qualities."[2] Tests are described as being more useful but still inadequate except for screening out the poorest risks.

With the job situations where an objective criterion may be applied becoming rare, and research on subjective criteria unsatisfactory even in the most controlled interpersonal situations (military), it is not surprising that the two widely divergent positions given below can be found in recent literature.

Guion has written "... the solution to the criterion problem does not lie in the typical efforts at statistical refinement. Much of this has been blind numerical manipulation." He continues to say that the search for an ultimate criterion (general satisfactoriness) is futile, and what must be done is to seek and use criteria which exist along many dimensions.[3]

Super, on the other hand, has stated, in conclusion to a review of several studies, "... apparently, no matter what the supervisor is asked to rate, no matter how specific the behavior he is asked to judge, he rates on the basis of a general evaluation of the person as a worker and as a person. In fact, it would hardly be an exaggeration to say that he rates the worker more as a person than a worker."[1]

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[1] Kipnis, David, and Glickman, Albert S. "The Prediction of Job Performance," Journal of Applied Psychology, 45: 50-56; February 1962.

[2] Bechtoldt, Harold P. "Problems of Establishing Criterion Measures," Personnel Research and Test Development in the Bureau of Naval Personnel. (Dewey B. Stuit, ed.) Princeton: Princeton University Press, 1947, p. 377.

[3] Guion, Robert M. "Criterion Measurement and Personnel Judgments," Personnel Psychology, 14: 141-149; Summer 1961.

Studies with direct relationships

Five studies reported in the literature have certain specific relationships to the study reported in the present volume. Kipnis and Glickman used eight traits of Navy enlisted men as criterion-measures, plus overall job effectiveness.[2] Two of the traits pertained to ability to maintain and operate equipment (similar to "Skills Unique to the Job" in the present study). The remainder pertained to a variety of personal qualities ("Personal Adequacy" was used in the present study to refer to a cluster of traits). The results showed a high overlap among some scales, and the best evidence of valid prediction occurred between tests of hand skills and the ratings on operating and maintaining equipment.

A study which was of considerable theoretical value in the design of the present study has been reported by Bell, Hoff, and Hoyt.[3] Three methods of rating were used in the study cited. Rating A was "job-oriented." The supervisor was first asked to list the tasks involved in a job which pertained to a specific cluster of workers. Then he rated each worker on each task. The result was ratings on different criteria. Rating B focused on behavior. Twenty-five pairs of positive and negative behavioral descriptions were checked (or not) by the supervisor. Rating C was a traditional trait-oriented scale, of ten traits. The predictor was the General Aptitude Test Battery. The results did not help much to make a case for the test battery, but the theoretical implications may be of considerable value. Ratings A and C had moderate positive correlations, and Rating B did not. The study reported in this volume has been an attempt to form a compromise between "job-oriented" and "trait-oriented" evaluations. Ranking the given traits provided some opportunity to reflect job-orientation.

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[1] Super, "The Criteria of Vocational Success," op. cit.

[2] Kipnis and Glickman, op. cit.

[3] Bell, Hoff, and Hoyt, op. cit., pp. 416-418.

The study by Carlson, et al., provided ideas for the present study in the measurement of satisfactoriness through ranking.[1] Ranking of workers in clusters where all do similar work has an advantage over rating in that the evaluator is forced to state his preferences, where in rating the evaluator can place most or even all workers in one classification. The differences among evaluators is also controlled to the extent that some might rate most high and others might rate most low. Ranking does not, of course, control the factor of differences in the average quality, or range of quality, among the clusters of workers.

An analysis of worker functions by Fine was helpful to the investigator in formulating a rationale for the job content factors and in devising a system of factor weighting based on ranks.[2] Fine, of course, has provided a much more advanced and complex analysis than could be fully used in the design of a restricted and simple pilot study.

Also of value as background to the rationale were two related articles by Sluckin which analyze in depth the problems involved in combining or not combining criteria of occupational success.[3] These analyses were not used directly in development of the present study but are noted as sources for studies in which attempts might be made to evaluate sub-criteria with some precision.

Curriculum and Job Performance

Relevant studies at the entry-job level

Research on the comparative effects of widely differing curricular patterns on the performance of specific jobs appears to be almost non-existent. Brandon and Evans state that survey research on even the placement success from differing programs is not plentiful (only one study cited), and "... data on success in the occupation are much less frequently available" (no study cited).[1]

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[1] Carlson, et al., op. cit., p. 55.

[2] Fine, S. A. "A Structure of Worker Functions," Personnel and Guidance Journal, 34:66-73; October 1955.

[3] Sluckin, W. "Combining Criteria of Occupational Success," Occupational Psychology, 30: Part I, pp. 20-26; January 1956. Part II, pp. 56-68; April 1956.

The investigator found no studies where workers on the same job definition from two or more differing types of curricula were compared on performance factors, with adjustments made in the statistical analysis for possible differences in intelligence, aptitudes and other background factors which could affect success. If a parallel were to be drawn from the research on predicting college success from differing high school programs, the hypothesis supported by the parallel rationale would be that few differences would be found in job performance between groups from differing pre-employment curricula. The well-known Eight Year Study, for example, resulted in findings in regard to the higher aptitude students which favored the experimental groups with relatively small but significant differences, and with differences between the groups of students of lower aptitudes which were not significant.[2] (The study reported in the present volume pertains to students with as low mean aptitudes as those with the lower aptitudes in the Eight Year Study.)

Only certain jobs would be subject to research focused on the above hypothesis. Vocations for which licensing is required by law, for which specific curricula are prerequisite, are not subject to such research under existing conditions. Other occupations for which specific training programs are not mandatory but are customary would require large-scale cooperation between education and industry to set up adequate test situations. Thomas has analyzed occupations according to their relationships to formal schooling. He has called attention to the possibility that customary or required training programs may not be "... functionally related to competent performance in the occupations."[3]

Two doctoral dissertations may be noted which approach the area of research sought for. Andre found that differences between general-academic and vocational-technical high school graduates in St. Louis were appreciable in regard to type of placement and other factors but that employers' ratings indicated no appreciable differences between job performance and work habits of the two groups.[1] Kjos, in a comparison of general high school graduates with some industrial arts courses and "day-trade" graduates with Smith-Hughes type of training, generally found slight differences favoring members of the day-trade group who were employed in industrial and skilled occupations in the Kansas City area. Employers rated day-trade graduates higher in more categories, but rated general graduates higher in leadership and in some technical aspects.[2]

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[1] Brandon, George L., and Evans, Rupert N. "Research in Vocational Education," Vocational Education, Sixty-fourth Yearbook of the National Society for the Study of Education, Part I. Chicago: N.S.S.E., 1965, p. 265.

[2] Chamberlin, Dean, et al. Did They Succeed in College? New York: Harper and Bros., 1942, pp. 207-209.

[3] Thomas, Lawrence G. The Occupational Structure and Education. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1956, p. 369.

Observations on evaluating curriculum

The studies on satisfactoriness noted earlier pertained almost exclusively to research completed by personnel psychologists focusing on military or industrial job performance--their emphases were on psychological tests as predictive criteria, and only rarely did curricular patterns in formal schooling or training enter the picture. Curriculum research by educators, on the other hand, almost never pertained to quality of performance in out-of-school life--of which competence in the world of work is the most accessible area. A search through the most likely reviews of research literature revealed almost no relevant studies, and even observations on needed research on post-school satisfactoriness were difficult to find. (Studies of "success" in the form of types of jobs obtained were not sought after.)

A few references to needed research (on curriculum evaluated through occupational outcomes) were found, but again these focused on the "criterion problem." Gagne has recommended that the direction of vocational change requires applications of principles of learning to analysis of the worker's role with an emphasis on knowledge and other more general competencies rather than the traditional analysis of "operations."[3]

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[1] Andre, Nevin E. "Post High School Educational Experiences and Occupational Status of General-Academic and Vocational-Technical High School Graduates." (Ed.D. thesis summary, mimeographed.) Columbia: University of Missouri, 1964.

[2] Kjos, Oscar E. "Occupational Experience and Success of Day-Trade Versus General School Graduates." (Ed.D. thesis summary report) The University of Missouri Bulletin, 55: No. 29; August 1954.

[3] Gagne, Robert M. "Military Training and Principles of Learning," American Psychologist, 17: 82-91; February 1962.

In an issue of The Review of Educational Research, on guidance, counseling and personnel services, the only reference to possible evaluation of higher education through ascertaining success on the job was a single sentence, "To a great extent, education that has been content to organize its programs has failed to study systematically the outcome or products in order to determine the improvements needed."[1] In an article on the vocational development process, the only references to post-school outcomes pertained to job satisfaction, with none to satisfactoriness.[2] In another issue of the Review..., devoted to curriculum planning and development, the article entitled "Curriculum Research" contained the following statement concerning the ultimate criteria of curriculum evaluation, "... it may be reasonable to hold curriculum research at an observational stage until investigators concerned with research on teaching and learning find improved ways to understand and make predictions relevant to variables in these areas (pupil gain and growth)."[3]

Leighbody summarized evaluation in trade and industrial education with a statement including these comments: "Serious attempts to evaluate outcomes in trade and industrial education have been few. No standardized tests, such as exist for measuring academic learnings, can be found... To know how well the product of the trade and industrial program has fared in his industrial life would require careful follow-up studies conducted over a period of years. No such studies have been reported."[4] Wenrich has written on the topic of vocational education a conclusion less direct but with a similar implication: "Vocational education programs are subject to direct evaluation by those who employ the product and by fellow workers in the occupation." No studies are cited on this point.[5]

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[1] Lloyd-Jones, Esther, and Smith, Margaret R. "Higher Education Programs," Review of Educational Research, 33: 163-170; April 1963.

[2] Walz, Gary R. "Vocational Development Process," Review of Educational Research, 33: 197-204; April 1963.

[3] MacDonald, James B., and Raths, James D. "Curriculum Research: Problems, Techniques and Prospects," Review of Educational Research, 33: 322-329; June 1963.

[4] Leighbody, Gerald B. "Trade and Industrial Education," Encyclopedia of Educational Research (ed. by Harris, C. W.) Third Edition. New York: MacMillan Co., 1960, pp. 1527-1528.

[5] Wenrich, Ralph C. "Vocational Education," Encyclopedia of Educational Research, (ed. by Harris, C. W.) Third Edition. New York: MacMillan Co., 1960, pp. 1562-1563.

A related article in the Encyclopedia of Educational Research entitled "Industrial Arts" contained no references whatever to post-high school evaluation, and, the article entitled "Secondary Education--Programs" included comments on five studies which involved post-school follow-up, but none of these pertained to job satisfactoriness.[1]

Theoretical observations from professional education

Determined efforts have been made to predict vocational satisfactoriness in several fields at the professional level of training, with some of the most thorough work reported for engineering education and teacher education. Even in these fields, however, studies are rarely made on comparisons of curricular patterns in regard to success on the job. Engineering studies emphasize placement success in relevant job definitions. Teacher education studies emphasize prediction of satisfactoriness from measures of aptitude, and less frequently, from measures of achievement.

The outstanding effort in the prediction of teacher satisfactoriness (effectiveness) is the 30-year series of studies by Barr and associates at the University of Wisconsin. Barr has written that "... the problem that needs clarification, possibly before all others, is that of the criterion of teacher effectiveness."[2] The three types of criteria used in the Barr studies have been (1) ratings of efficiency or effectiveness by superintendents and other supervisory personnel, (2) measures of pupil achievement, and (3) a pre-service criterion, from the preparatory experience in college. To solve the criterion problem, Barr stated, there is a need to develop "... An acceptable theory of the nature and structure of teaching ability... The prevailing theory is an elementalist factor theory... (in which) the elements are presumed to be additive. A hypothesis advanced...is that possibly the ingredients of effectiveness are not additive and an inadequacy in any one of a number of critical factors may make the teacher thoroughly unacceptable...

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[1] Brink, William G. "Secondary Education--Programs," Encyclopedia of Educational Research (ed. by Harris, C. W.) Third Edition. New York: MacMillan Co., 1960, pp. 1259-1272.

[2] Barr, A. S., and others. "Wisconsin Studies of the Measurement and Prediction of Teacher Effectiveness: A Summary of Investigations," Journal of Experimental Education, 30: 1-156; September 1961, p. 147.

notwithstanding... (the teacher's) abilities in other respects. The factors which are considered critical may vary from community to community."[1]

The "criterion problem" as outlined by Barr could be modified to fit almost any type of job. Entry jobs in business and industry, as well as many professional and semi-professional jobs in technical fields, may be more subject to analysis than the vastly subtle and complex concept of "teaching effectiveness." But the relationship between curriculum patterns and job satisfactoriness seemed, at the time the present study was undertaken, to be virtually unexplored.

Literature on the Broader Problem

The last of four major topics to be discussed in the review of literature pertains to information and background concerning the broad problem of education and jobs.

Employment and vocational education

Wolfbein has observed, regarding the problem of employment, that 26 million young people will enter the labor force during the 1965-75 decade, while the number of older workers who will leave is only a fraction of this volume. This fact must be assimilated along with the fact that productivity per worker has approximately tripled in the past 50 years; for example, in the production of automobiles 17 per cent fewer workers were required in 1963 to turn out the same number of automobiles as in 1955.[2]

The magnitude of the employment problem which will occur whenever the rising rate of consumption of goods fails to keep up with the rising rate of productivity per worker can only be speculated upon. The importance of the problem, however, justifies intensive research on all aspects. Rosen has summarized the basic need for teamwork between placement people in the employment service system and vocational educators, along with the need for accurate information on current and prospective employment both locally and nationally.[1]

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[1] Ibid., p. 147.

[2] Wolfbein, Seymour L. "Automation, Education, and Individual Liberty," Teachers College Record, 66: 27-32; October 1964.

The Office of Manpower, Automation, and Training has provided comprehensive annual reports on the status of employment and unemployment, along with projections of the needed economic growth commensurate with rates of expansion of the labor force and productivity factors by major industries and occupations. The educational levels needed for fulfillment of requirements for skills and knowledge have been outlined. Educational needs vary from formal school training in skills to on-the-job training to education for basic literacy.[2]

Vocational preparation in the broad curriculum

The sharp distinction between vocational preparation and general education which is characteristic of the educational systems of most European countries has not been as clearly drawn in the United States. Wherein European education tends to stress liberal studies almost exclusively until the time arrives to begin vocational or professional studies almost exclusively (earlier for vocational, later for professional), American education has usually found vocational preparation occupying a major place in the total curriculum.

Preparation for the world of work has been an integral part of such central statements of educational objectives as those issued by the National Education Association's Commission on Reorganization of Secondary Education and the Educational Policies Commission. The seven Cardinal Principles of Secondary Education included "vocational efficiency" as one major objective. Education for All American Youth (Educational Policies Commission, 1944) outlined four major objectives of education, including "fulfillment of economic needs." The remaining three objectives outlined were: "the development of the learner;" "the improvement of home, family, and community life;" and, "performance of civic and social duties."[3] (Combining the latter two objectives would cause the foregoing list to approximate the three objectives used in the rationale of the present study.)

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[1] Rosen, Howard. "Vocational Education and Manpower Needs," Occupational Outlook Quarterly, U.S. Department of Labor, December 1964, pp. 5-8.

[2] U.S. Department of Labor, Manpower Report..., op. cit.

[3] Kearney, Nolan C. and Cook, Walter W. "Curriculum," Encyclopedia of Educational Research (ed. by Harris, C.W.). New York: MacMillan, 1960; pp. 358-364.

In introducing the Taxonomy of Educational Objectives, Bloom, *et al*., state that they conceive of three major parts to a complete taxonomy: the "cognitive domain," focusing on knowledge and intellectual abilities and skills; the "affective domain," concerning interests appreciation, attitudes, values, and adjustment; and, the "domain of manipulative or motor skills."[1]

Two approaches to classifying educational objectives are illustrated above. Both have been used in the rationale of the present study. "Preparation for the world of work" is the "area of living" through which an approach to the evaluation of curriculum has been developed. Within the "world of work" (the job-situation), all three of the "domains" of Bloom's taxonomy have been used in the evaluation of workers' satisfactoriness: the "cognitive domain" is represented by "Communications Competency;" the "affective domain" is represented by "Personal Adequacy;" and, the "domain of manipulative and motor skills" is represented by "Skills Unique to the Job." Of course, the validity of these representations vary from job to job, and only in a pilot study would the grouping of job types be an acceptable procedure.

Evaluation of the "affective domain"

The success of high school experiences in the "cognitive domain" can be partially tested against achievement in post-high school educational programs, and to some extent in out-of-school life through tests which might be administered. The success of teaching the "domain of manipulative and motor skills" can theoretically be measured in research situations which are roughly parallel to those associated with the "cognitive domain"--although relatively little of such research has been accomplished. However, the "affective domain"--the "domains" are from Bloom's taxonomy --is presently unexplored by research which might tend to support the affective objectives of school curriculum, and no parallel constructs, such as achievements which can be objectively measured as partial outcomes, are available.

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[1] Bloom, Benjamin. Taxonomy of Educational Objectives: Part I, The Cognitive Domain. New York: Longmans, Green, 1956; pp. 3-4.

This relatively barren area of the research literature should someday be richer in important studies. The development of human beings in ways related to interests, appreciations, attitudes and values has long been a prime objective of education, but without means of evaluating outcomes, or even establishing clear relationships to presumed outcomes, the curriculum designed toward these ends is less easy to defend. The Hawthorne Plant studies reported by Rothlisberger and Dickson are perhaps the best-known early source of research on the importance of human relations factors in job performance.[1] Trends seem to indicate that the affective outcomes of education will become increasingly important to success in the world of work--or in most walks of life--in the future. The job, as an environment in which research on educational outcomes can be reasonably attempted, should and will be used for this purpose.

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[1] Rothlisberger, Fritz J. and Dickson, William J. Management and the Worker. Cambridge: Harvard University Press, 1939.

CHAPTER III

DESIGN AND PROCEDURES

PART ONE: PRELIMINARY CONSIDERATIONS

Introduction to Chapter III

The present chapter is divided into three major parts, to aid in organization of a large amount of detail. Part One reviews essential aspects of the introductory chapter and reports the rationale and tests used to validate the scoring of raw data. Part Two presents the detailed rationale for and the descriptions of the variables. Part Three features an outline of the tests of relationships which were conducted and the follow-up study for validation purposes.

The overall objective of the study was to attempt some contribution toward evaluating senior high school curriculum through ascertaining relationships with aspects of graduates' performance on their first full time jobs. This objective is not likely to be achieved except through the completion of numerous large-scale studies conducted over a period of years or even decades.

The possible contributions of the present study--entitled a "pilot approach"--was thought to be mainly in exploring the potential of certain techniques of evaluating job performance and in relating these measures of performance to selected measures of school achievement or behavior. The latter measures were selected because of their universal availability in school records, not because they are necessarily the measures most logically-connected to the job performance factors which were developed.

The preliminary major task was to devise and try out a technique of defining jobs--particularly entry jobs obtained by male high school graduates. The essentials of the technique which was devised were illustrated in Figure 1, and this figure is repeated in the present chapter as Figure 2.

The first purpose of the method was to make it possible to obtain the needed information in the time allotted to each interview. The second purpose was to scale the jobs by their difficulty of performance (termed "demandingness") so that this factor would be more or less controlled. The third purpose was to classify the jobs into six types according to "content," which was done by having the employers rank the relative importance of three content factors common to almost all jobs.

The validity of the method of "defining" jobs can of course be questioned, since it involves the "criterion problem" which has plagued all who have attempted to obtain job performance evaluations. They validity of the job-defining could not be explored with satisfactory thoroughness in the context of a pilot study, and neither could the validity of the connections with the predictor measures be properly explored.

The subsequent major task of the study was to test for predictive relationships between measures of school experience and performance on-the-job. (The parallel predictive relationship is that which has been established between class rank in high school and the comparable relative standing of high school graduates in college-level academic rank.[1])

The general position which was examined in testing a wide variety of specific relationships may be stated as follows: Although relationships between school experience and satisfactoriness of performance on-the-job may be impossible to demonstrate as causes and effects, these relationships contain valid predictive potential. As relationships were found, in patterns which reinforced each other and supported meaningful interpretations, this predictive potential was tapped, at least in small part.

The variables tested for relationships

Six major variables were selected and tested for statistically significant relationships. These may be best considered as three sets, or pairs, as outlined below.

a) School experience factors

  (1) School achievement, as measured by class rank, averages of letter grades in English and in vocationally-oriented subjects, and school attendance record

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[1] Travers, op. cit., p. 154.

(2) School programs, with high school graduates classified according to the amount of vocationally-oriented course work taken (plus classification according to whether or not each has a job related to his training)

b) Job definitions

(1) Classification by job content, according to six arbitrary descriptions based on the priority orders of the performance-areas entitled "Communications Competency," "Personal Adequacy," and "Skills Unique to the Job"

(2) Level of "demandingness" of jobs, based on a hierarchy of difficulty of performing the operations involved

c) Evaluations of satisfactoriness

(1) Ranking of workers on each satisfactoriness criterion--"Communications Competency," "Personal Adequacy," "Skills Unique to the Job," and "Overall Satisfactoriness" (by the supervisor on each job)

(2) Rating of each worker[1] as "satisfactory" or "unsatisfactory" (by the supervisor on each job)

It will be noted that the first two of the six elements listed above are functions of the schools and of students in school. The middle two elements are descriptions of the initial jobs held by these individuals after graduation. The last two elements are the evaluations of the success or satisfactoriness of these individuals in terms of the job descriptions.

Introduction to the procedures

The procedures followed in making tests of relationships of the measurements and classifications above involved carrying out a number of tasks, which included:

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[1] "Worker(s)" here refers to all workers in the group under supervision who meet the criteria of selection for the principal subjects of the study.

a) collecting the data from the subjects and from school records;

b) defining the limits of applicability of findings;

c) establishing a base for combining achievement measures from two or more schools;

d) defining all normally distributed characteristics in terms of appropriate standard scores;

e) defining the school programs in comparable terms;

f) defining the performance factors or content of jobs in comparable terms;

g) defining the "demandingness" of jobs in comparable terms;

h) conducting the ranking and rating procedures for relative satisfactoriness, on each of the success-criteria, and transforming these ranks to comparable scores;

i) analyzing the findings of meaningful relationships and non-relationships;

j) partially validating the representativeness of the schools by comparing subjects with co-workers from other schools;

k) checking differences between subjects "carelessly selected" with those "carefully selected," and interpreting other miscellaneous data.

The Statistical Methods

Numerical units

All computations in the study were made from one-digit values, to aid in computation and presentation. The reduction in precision from the two and three-digit figures in which some of the data were found in the school records is thought to be acceptable, because comparisons were made with other values where four to six intervals or classifications were the maximum available. Also, comparisons were made chiefly through use of chi-square tests of significant differences--which meant that four to six groupings of data were the maximum permitted, since the expected frequencies per cell must exceed five (in all except an occasional cell) if valid chi-square statistics are to result.[1]

The distributions formed from data which can be assumed to be approximately normally distributed were assigned one-digit scores based on the "sten" ("standardized scores in tens") formula.[2] This formula was selected because:

a) it provides for the maximum number of intervals on a one-digit scale (by subtracting one from each value in making calculations);

b) it forms a distribution which divides at the median for median-split comparisons;

c) frequency distributions by "stens" can be interpreted in standard deviation equivalents; i.e., the distance between division points of the intervals can be read as one-half standard deviation.

"Stens" also would have been appropriate for scoring the ranks on satisfactoriness but were not usable because the worker-groups contained too few members to apply the percentage formula. Instead, a procedure was devised to obtain approximations of standard scores in what became essentially a system of classification into a scale of four intervals. In brief, this system began with having 5.5 represent the mean (as it does in the theoretical model of the "sten" distribution) with scores of six and seven above the mean and scores of four and five below the mean. Ranks were weighted according to the number in each ranked cluster.[1]

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[1] Walker, Helen M. and Lev, Joseph. Statistical Inference. New York: Holt, Rinehart and Winston, 1953. See page 107 for rules concerning expected frequencies per cell with varying degrees of freedom and varying acceptability of probabilities.

[2] Lyman, op. cit., pp. 94-95. The percentages assigned to each of the 10 intervals follow this order: 2%, 5%, 9%, 15%, 19% (median) 19%, 15%, 9%, 5%, 2%. Whenever a percentage line was found to cut through a cluster of equal scores, the value assigned to all scores in the cluster favored the majority side.

Sample size

The size of the basic sample (150) was chosen so that expected frequencies per cell would nearly always exceed five to meet the requirement of minimum expected frequencies per cell, but at the same time the sample was considered to be quite adequate for the exploratory purpose of the study.[2] The opportunities for analysis of sub-groups within the larger group was limited by the sample size, however.

Testing the hypotheses

Chi-square tests were computed in reference to null hypotheses. Since the nature of the data permits no rationale for fixing the exact probability values (associated with the chi-square statistics) at which significance of results will be recognized, the probability values are reported with an arbitrary acceptance of the null hypothesis for values of .10 or more, and an arbitrary rejection of the null hypothesis for values of .05 or less.[3] Values between .05 and .10 are neither accepted nor rejected. The confidence with which interpretations are made varies according to whether the specific findings form reinforcing clusters or appear singly.

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[1] Walker and Lev, op. cit., p. 480. Table XX, "Transformation of Ranks to Standard Scores," provided the based for interpolating ranks into numbers on the four-interval scale.

[2] Hays, William L. Statistics for Psychologists. New York: Holt, Rinehart and Winston, 1963, p. 332. Hays states that small samples are actually superior when the researcher's purpose is to explore a problem economically and where he is trying to map out the main relationships in some area.

[3] Walker and Lev, op. cit., p. 464. Probability values associated with the chi-square statistics are taken from Table VII, "Percentile Values of the Chi-Square Distribution."

Chi-square computations were performed through use of the UMSTAT 62 Program, "Chi-square from Raw Data,"[1] processed by the Control Data 1604 computer located at the Numerical Analysis Center, University of Minnesota. Both expected and observed frequencies were printed, to aid the writer in interpretations, although only the observed frequencies are presented in the tables. Chi-square tests were believed to be more suitable than some alternative statistical operations might have been, because most of the data were in the form of classifications, and only gross relationships were being sought.

Schools, Subjects and Community

The subjects

The group of 150 boys evidenced certain characteristics which would differentiate it from groups of college-bound youth or school dropouts. The group possessed characteristics in the form of somewhat restricted distributions of traits and aptitudes. It was discovered that the members of this group tended to be "C" and "D" students in English courses, but tended to do somewhat better in vocationally-oriented courses, and tended to have average scores in tests of general intelligence and differential aptitudes.

According to the defined criteria, members of this group were not school dropouts, they obtained jobs on the competitive market and kept them past the normal probationary period, and they did not go to college. It is not known how the subjects would have compared, as a group, with their classmates who entered military service upon graduation. At the time this study was conducted, the type of boy characterized by this group was relatively neglected in educational research and development programs, with the greater efforts being made for the benefit of college-bound and disadvantaged groups.

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[1] Numerical Analysis Center, UMSTAT Computer Programs Manual. Minneapolis: University of Minnesota Numerical Analysis Center, 1964.

The schools

Subjects of the study were selected male members of the 1963 graduating classes of three senior high schools in the metropolitan area of Minneapolis, Minnesota, which represented the three basic types of large public high schools in most metropolitan areas: an urban vocational high school, an urban comprehensive high school, and a suburban comprehensive high school. These may be symbolized as UV, UC, and SC, respectively. The schools were Vocational and Roosevelt senior high schools of the Minneapolis Public Schools, and the Robbinsdale Senior High School of Independent School District No. 281, Robbinsdale, Minnesota.

A reason for choosing these particular schools was that the comprehensive schools had large enough graduating classes so that in each school approximately 50 subjects would qualify, from one graduating class, under the criteria for selection of subjects (UC = 669, SC = 758). The vocational school had a much smaller class (UV = 291), but a much higher proportion were males who entered the labor market immediately upon graduation. The comprehensive schools were selected partly because they had a full range of clientele, with almost half from each school entering some kind of college program upon graduation.

The 150 high school graduates who became the principal subjects of the study were selected according to criteria defined in the present chapter. The objectives in devising the criteria were (1) to eliminate graduates who would tend to reflect the differences among schools, and (2) to eliminate graduates for whom an accurate evaluation would not likely be obtainable. Those who did qualify on the criteria would then presumably form groups with approximately similar characteristics from the several schools, and could then be evaluated with some validity.

Follow-up studies which were available in two of the schools were used to screen out those in college or those in military service for more than the six-month basic program. Homes of graduates of the third school were telephoned to determine each graduate's status. (The numbers in military service at the time the contact was made, 14 or 15 months after graduation, were: 34 from the urban vocational school, 44 from the urban comprehensive school, and 64 from the suburban comprehensive school. These numbers are roughly proportionate to the sizes of the graduating classes.)

The community and the employment climate

At the time of the study Minneapolis was a city of a half-million population, with suburban municipalities totaling almost another half-million, and with the adjacent city of St. Paul and suburbs adding more than a half-million, for a metropolitan area total exceeding $1\frac{1}{2}$ millions. The business and industry of the area featured electronics and similar industries requiring a high proportion of technically-trained people, along with a predominance of light industry and the normal service and commercial enterprises of a metropolitan area.

The employment climate at the time the data were gathered was favorable, with unemployment rates lower than average for the 1955-1965 decade. This factor is of importance because application of the criteria for selection of subjects during a time of economic recession and high unemployment would probably affect the distributions of characteristics of the subjects, in that some of those who were employed past 90 days in this study would not qualify on this criterion. The technical emphasis of the area's industry is not thought to have affected the study greatly, because very few of the entry-jobs were at the higher levels of skill requirements.

Three Sources of Data

Interviews with the subjects

Each boy from the 1963 graduating roster who was seemingly eligible as a candidate for the study was telephoned by a guidance counselor from his school and engaged in a structured interview. For each boy interviewed the counselor recorded the place of work, the job description, the starting and ending dates of the job to be studied, the name of the direct job supervisor, and the method of obtaining employment. Various questions were asked about whether or not school experience assisted in performance of certain tasks. (A copy of the interview form appears in Appendix B as Form I.)

Data from school records

The investigator obtained from the official school records certain information regarding each subject. These data included the class rank, grade average in six semesters of required English, grade average in vocationally-oriented courses for those so qualified, an intelligence quotient, scores on five scales of the Differential Aptitude Tests, the composite number of days absent and/or tardy in grades 10-12, and a list of the vocationally-oriented courses taken and consequent classification of each graduate as either "vocationally-oriented" or "general." (A copy of the form used to record data from school records appears in Appendix B as Form II.)

The interviews with employers

The employers were interviewed personally by the investigator at the 123 places of employment. The procedure followed was to first telephone each place of employment to obtain the name and title of the proper person to contact for obtaining permission to conduct an interview. Letters followed (individually typed but identical except for the inside address and salutation), mailed to groups of employers selected geographically. (A copy of this letter and the accompanying explanation appears in Appendix B as Form III.)

Next, the officials to whom the letters had been addressed were telephoned and appointments for interviews were arranged with the officials contacted (who were owners or personnel directors), plus interviews with foremen or supervisors. More often than not two persons were interviewed to obtain evaluations concerning each job-situation.

In each interview, the descriptions of the jobs and the periods of time worked, as submitted earlier by the subjects, were confirmed or modified by the employer, and a few additional questions were answered. (The form used to record background information from employers appears in Appendix B as Form IV, Part A, and a list of all employers appears in Appendix C.)

Defining the jobs. After providing the background information, each employer classified the job in question as best fitting one of six classifications, according to the priority order of the three job-content factors defined for this purpose. Each employer also classified the job according to a four-point hierarchy of "demandingness." (The operations noted immediately above are described in detail subsequently. Copies of the cards used to rank the job-content factors appear in Appendix B as Form IV, Part B. The demandingness scale is the last item on Form IV, Part A.)

Ranking of workers among clusters of co-workers. After ranking the job-content factors, the employer ranked each principal subject on each factor, among the cluster of comparable co-workers. (A copy of the name slip used in obtaining the rankings appears in Appendix B as the last item on Form IV, Part B.) In most cases, the identity of the principal subject was not disclosed to the supervisor who did the ranking, to avoid the chance of bias, although identification of the subject often had to be made to the company owner or personnel director to help establish proper rapport for the interview. The sequence of ranking was made, in each instance, in the order that the three factors were considered to be important to each job. Then, a similar ranking was made on "Overall Satisfactoriness," and, finally, the employer rated the workers in the cluster as "Satisfactory" or "Unsatisfactory."[1]

The investigator attempted in each interview to obtain from the supervisor a minimum of three comparable co-workers and a maximum of five, after it was discovered in the initial interviews that the interview became cumbersome with more than six individuals to compare. In a few instances, where more than six were qualified for ranking, the group was reduced by choosing only those who were 1963 graduates of local high schools, or, in a few cases involving larger numbers, the first six graduates of 1963 listed (alphabetically) were used.

Applicability of the Findings and Limitations of the Design

Applicability of findings

To make the format of these comparisons (and some hypotheses for further testing) applicable to similarly selected graduates of many or most high schools, a basic assumption was first partially tested. This assumption was: when the criteria used in this study for selecting subjects are applied to the graduating classes of three varying types of high schools, one year after graduation, the resulting groups of subjects would not differ significantly on selected school-measured criteria (an intelligence quotient, five scales of an aptitude test battery, and the attendance record). The rationale here advanced is that, if the preceding assumption could be defended through demonstrating that the groups selected by the given criteria from three differing types of schools were substantially similar, then the same assumption could be extended to groups selected by the defined criteria from many or most high schools.

The three high schools from which subjects of this study graduated were selected from the three basic types of public high schools which can be found in most metropolitan areas: (1) a vocational high school located in the city-center which draws students from throughout the city school system; (2) a comprehensive high school which serves a mainly-residential portion of the city school system; and, (3) a comprehensive high school which serves a mainly-residential suburb adjoining the city. To provide support for the assumption of similarity, it was necessary to ascertain whether or not the selected subjects from these three schools differed significantly, as groups, on the selected indicators of school achievement and on the attendance record.

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[1] The basic ranking procedure is patterned somewhat after the procedure used by Carlson, *et al.*, in *The Measurement of Employment Satisfactoriness*, *op. cit.*, p. 55.

Limitations of applicability

No conclusions resulting from carrying out this design could properly apply to whole school populations. Even to the populations selected through the given criteria, applications of results are properly made only as hypotheses for further testing. The foregoing statement is true for three separate sets of reasons.

First, some of the basic instruments or techniques of measurement (of job content, of worker "satisfactoriness," and of the demandingness levels of the jobs) are not validated or established instruments or techniques but rather are presented in pilot form in this study, and if they are to acquire validity they must be developed and refined in further research.

Second, the observations made were on deliberately selected populations, extracted from the complete populations of the schools by use of criteria which tended to limit the observations to subjects from the middle ranges of the post-high school population (those in post-high school education tended to be drawn from the upper academic and/or socio-economic levels, and the dropouts and the unemployed tended to be drawn from the lower academic and/or socio-economic levels, leaving the middle ranges predominant in the study).

Third, comparisons of groups of subjects from the three schools did not include socio-eonomic comparisons or comparisons of disciplinary records, or other factors which might be proposed as causes of differences among the school-groups. (The assumption made here is that these latter comparisons would also show no significant relationships, if the same selective criteria were applied in designating the groups.)

The Assumption that Subjects Selected on the Defined Criteria are Similar, as Groups, from School to School

It has been noted that the findings of the study could have little value for generating hypotheses for further testing unless the findings could be shown to apply to groups similarly selected from many or most high schools. To establish or reject the reasonableness of this statement of applicability, two procedures were utilized.

First, criteria were used in selection of subjects which presumably caused the resulting groups to be distributed similarly from school to school. Second, the data were assembled and compared through statistical means.

The criteria for selection of subjects

a) Male sex only. Because sex differences would be present in many school achievement and job success evaluations, this factor was controlled by considering the male sex only.

b) 1963 graduating class. One large graduating class was presumed to have approximately the same distributions of characteristics among its members as another large class from the same school, because changes in a school's clientele are thought to occur slowly, over a period of years.

c) No post-high school training. Because the effects of high school programs were to be studied, graduates with post-high school training were eliminated. Exceptions were college dropouts after one quarter or semester of study unrelated to the job, or those with six months of military service in which no training other than basic training was given.

d) No apparent handicaps. Many retarded or otherwise handicapped students did not graduate, but those few who did would presumably be at a disadvantage in seeking employment, and so were eliminated. It was presumed that most Negro graduates would be at a disadvantage in obtaining employment because of employers' biases, and in this sense Negro graduates were considered for elimination as "handicapped." However, it was discovered that no Negro graduates qualified otherwise. Those few who graduated entered college or the armed services or were unemployed when contacted.

e) Unmarried. Married graduates were presumed to have stronger motivational influences which affect work success, and therefore were eliminated from the study. Those who were married at the time the investigator conducted the evaluation interview with the employer, but who were unmarried at the point of evaluation (usually when passing the 90-day probationary period) were included.

f) A minimum tenure. A three-month period was considered the minimum time needed for the employer to know the subject well enough for ranking him against co-workers who also had worked at least 90 days and were similar in other respects. This also eliminated those who might have been entirely without full-time employment during the year following graduation.

The above criteria tended to eliminate graduates from the upper end of the school achievement scales and also some from the lower end. In addition, some subjects were eliminated for reasons unrelated to their qualifications for employment. These latter reasons affected fewer individuals and were presumed to be associated with graduates who would be randomly distributed on other criteria. Graduates thus eliminated included the following:

a) Graduates who had moved away from the Twin Cities area;

b) Graduates who had worked under a supervisor who was either unavailable or uncooperative; (only two employers were found to be uncooperative, and seven were unavailable);

c) Graduates who had worked where the supervisor was unable to recall comparable young workers who did the same work, and therefore could not be assigned a rank; in all but three cases supervisors could recall a sufficient number of former workers who qualified on the given criteria so that the rankings could be assigned;

d) Graduates who had worked for a relative or neighbor, or in a situation where the supervisor would be substantially influenced by knowledge of a worker's "connections with the boss"; the counselors eliminated the obvious cases in the telephone interviews, and in a few borderline bases the writer managed to arrange the interview with supervisors who showed no apparent bias--evidenced by the fact that they ranked the principal subject below average.

The criteria for comparing school groups

a) A group-administered test of intellectual aptitude (I.Q.), recorded in the junior high years. The Otis Form B was the test most commonly recorded for 1963 graduates, but scores of other tests were used when the Otis had not been given, as other group-administered intelligence measures are thought to be comparable enough for this criterion.

b) The senior high school attendance record, computed as all absence plus tardiness in grades 10 through 12.

c) The Differential Aptitude Tests, administered in Grade 9.[1] Scales for Verbal, Numerical, Abstract, Space, and Mechanical aptitudes were used. A few subjects did not have these tests recorded for them, and so these were treated as missing data in the calculations.

Table 3 illustrates the distributions of intelligence quotients which were recorded for the three school-groups, with the one-digit values assigned to the respective intervals. The percentages assigned to each value are based on the "sten" formula for approximating standard scores.

Table 4 illustrates the distribution of the attendance record, which for each subject is his combined absence and tardiness in grades 10 through 12.

Tables 5 through 9 illustrate the distributions of scores on the Differential Aptitude Tests, with assigned one-digit values. The scores as recorded in school records were found in percentile ranks grouped in intervals of five.

Testing the similarity of the school groups

It was apparent that the study could not proceed further until the assumption that the school-groups were similar in distributions of characteristics was defended. Therefore, tests of significant differences were conducted as part of the design.

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[1] Bennett, George K., Seashore, Harold G., and Wesman, Alexander G. Differential Aptitude Tests (3rd Ed.) New York: Psychological Corporation, 1959.

TABLE 3

INTELLIGENCE QUOTIENTS, BY SCHOOLS,[1] WITH CONVERSION TO "STENS"

Percentile Rank	Frequencies by School Urban Vocational	 Urban Comprehensive	 Suburban Comprehensive	"Sten"
125 +	--	--	4	10
120-124	--	2	3	9
112-119	6	6	4	8
106-111	8	5	6	7
103-105	8	8	12	6
98-102	9	12	6	5
93- 97	10	5	5	4
88- 92	7	5	--	3
81- 87	4	2	1	2
72- 80	2	--	1	1
	54	45	42	

[1] Intelligence quotients were not available for 6 subjects out of 150.

TABLE 4

ATTENDANCE RECORDS BY SCHOOLS, WITH CONVERSION TO "STENS"

Total absent plus tardy in grades 10-12	Frequencies by School Urban Vocational	 Urban Comprehensive	 Suburban Comprehensive	"Sten"
0-1	1	1	--	10
2-4	2	2	3	9
5-12	7	6	4	8
13-18	5	9	6	7
19-26	8	15	6	6
27-37	11	7	9	5
38-54	7	8	9	4
55-77	9	3	2	3
78-99	3	--	3	2
100 or more	2	--	2	1
	55	51	44	

TABLE 5

THE DAT* VERBAL SCALE BY SCHOOLS, WITH CONVERSION TO "STENS"

	Frequencies by School			
Percentile Rank	Urban Vocational	Urban Comprehensive	Suburban Comprehensive	"Sten"
95-100	--	1	2	10
85-90	2	2	1	9
70-80	8	7	5	8
60-65	5	6	4	7
40-55	12	10	3	6
25-35	9	10	8	5
20	7	8	4	4
5-15	8	3	3	3
1-4	4	1	2	2
	--	--	--	1
	55	48	34	

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*Bennett, _et_ _al_., _op_. _cit_. Scores were not available for a few subjects, causing column totals to vary from the complete totals for schools.

TABLE 6

THE DAT NUMERICAL SCALE BY SCHOOLS, WITH CONVERSION TO "STENS"

	Frequencies by School			
Percentile Rank	Urban Vocational	Urban Comprehensive	Suburban Comprehensive	"Sten"
96-100	--	1	2	10
90-95	6	4	3	9
80-85	2	3	1	8
60-75	6	11	4	7
40-55	10	10	7	6
30-35	9	5	6	5
15-25	14	9	4	4
5-10	4	2	4	3
1-4	4	3	2	2
	--	--	--	1
	55	48	34	

TABLE 7

THE DAT ABSTRACT SCALE BY SCHOOLS, WITH CONVERSION TO "STENS"

	Frequencies by School			
Percentile Rank	Urban Vocational	Urban Comprehensive	Suburban Comprehensive	"Sten"
	--	--	--	10
95-100	2	5	3	9
85-90	10	2	8	8
75-80	7	6	1	7
60-70	9	9	5	6
45-55	12	6	9	5
20-40	9	9	2	4
10-15	3	6	3	3
1-5	4	5	2	2
	--	--	--	1
	55	48	34	

TABLE 8

THE DAT SPACE SCALE BY SCHOOLS, WITH CONVERSION TO "STENS"

	Frequencies by School			
Percentile Rank	Urban Vocational	Urban Comprehensive	Suburban Comprehensive	"Sten"
96-100	2	3	--	10
95	--	3	--	9
90	3	2	3	8
80-85	8	7	7	7
60-75	17	10	4	6
45-60	13	8	4	5
25-40	7	8	8	4
10-20	1	5	2	3
1-5	4	2	5	2
	--	--	--	1
	55	48	34	

TABLE 9

THE DAT MECHANICAL SCALE BY SCHOOLS, WITH CONVERSION TO "STENS"

	Frequencies by School			
Percentile Rank	Urban Vocational	Urban Comprehensive	Suburban Comprehensive	"Sten"
96-100	2	2	1	10
95	1	1	2	9
80-90	3	9	2	8
65-75	5	10	6	7
55-60	14	3	6	6
40-50	14	9	4	5
20-35	4	11	7	4
10-15	7	1	3	3
5	4	1	1	2
1-4	1	1	1	1
	55	48	34	

Because the principal subjects were selected, and were not sampled from populations whose distributions of tests scores and other measures could be assumed to be normal, the question of normality arose. Examination of the distributions given in Tables 3-9 provided a reasonable basis for assuming that very large samples of subjects selected similarly would approximate normal distributions. The application of the "sten" formula was therefore considered to be appropriate.

Chi-square tests of goodness of fit were computed, relating the three school-groups with the distributions of intelligence quotients, five scales of the Differential Aptitude Tests, and the three-year attendance record.

The null hypotheses were:

a) There are no significant relationships between distributions of intelligence quotient and
school attended;

b) There are no significant relationships between distributions of attendance record and
school attended;

c) There are no significant relationships between distributions of Verbal scale of the DAT battery and
school attended;

d) There are no significant relationships between distributions of Numerical scale of the DAT battery and school attended;

e) There are no significant relationships between distributions of Abstract scale of the DAT battery and school attended;

f) There are no significant relationships between distributions of Space scale of the DAT battery and school attended;

g) There are no significant relationships between distributions of Mechanical scale of the DAT battery and school attended.

Findings with respect to the above hypotheses

Factor vs. Schools	X^2	d.f.	p	Sig.	Table No.
Intelligence quotient	15.449	10	$.25 > p > .10$	No	3
Attendance record	11.132	10	$.50 > p > .25$	No	4
Verbal DAT	8.338	10	$.75 > p > .50$	No	5
Numerical DAT	7.613	10	$.75 > p > .50$	No	6
Abstract DAT	12.993	10	$.25 > p > .10$	No	7
Space DAT	10.228	10	$.50 > p > .25$	No	8
Mechanical DAT	20.439	10	$.05 > p > .025$	Yes	9

The probability values associated with the chi-square statistic reached the significant level ($p < .05$) in only one instance, the Mechanical scale of the DAT battery. The other null hypotheses were accepted. This one relationship was further explored by testing the relationships between the Mechanical scale and (1) job content--to see if the Mechanical DAT related to obtaining jobs where technical skills were valued most, plus (2) the employers' rankings of workers on Skills Unique to the Job. The probability values associated with the chi-square statistics in these latter tests were:

(1) $.75 > p > .50$ (Table 1A)
(2) $.90 > p > .75$ (Table 2A)

These findings are thought to justify the conclusion that the relationship between school attended and this one DAT scale (Mechanical) need not modify the basic assumption.

Interpretation

To present evidence that the school-groups are not significantly different in every potentially important respect would require that many additional comparisons be made, perhaps of socio-economic and attitudinal factors as well as factors related to academic aptitude and experience. For this reason, the interpretation is limited to a claim that the assumption is reasonable, and has been supported in part by evidence, that the school groups are enough alike so that equal proportions might be assigned the "sten" values on scales of school achievement and attendance.

PART TWO: DEFINING THE THREE PAIRS OF BASIC VARIABLES

School Achievement Measures and School Programs

At this point in execution of the design, the assumption that the school groups were similar had been accepted. Therefore, it became possible to assign the "sten" values to all distributions which approximated normal distributions.

The following sub-headings provide the detailed rationale concerning the variables and the derivations of the actual numerical values used in the specific statistical tests of relationships.

Of the three sets of basic variables, (a) school experience factors, (b) job definitions, and (c) evaluations of success in employment, the present section pertains to the first of these, the school experience factors, sub-divided into:

(1) the measures of school achievement, and
(2) the type of school program.

School Achievement

Measures of achievement such as class rank or letter grade averages in groups of related courses cannot be meaningfully compared from school to school in their raw form. A "C" in a school with strong academic competition might refer to the same level of performance (in terms of potential for succeeding in a particular program of a particular college) as a "B" would mean in another high school. This lack of a common base for comparisons is true of whole graduating class populations, and is also true but in lesser degree for the school-groups selected by the criteria defined for the study.

Starting with the assumption that the school-groups selected were approximately equal in academic potential, motivation, and presumably other characteristics as well, it was then further assumed that the groups were also approximately equal in total school achievement, English achievement, and achievement in vocationally-oriented courses.

That is, if it turned out that the groups from one school had higher English grades (for example) than the average English grades of groups from the other schools, it was assumed that they were equal, on the average, in "real" achievement, and so assigning the "sten" values according to the "sten" percentage formula caused the distributions to be scored equally, with a student from the vocational school with a "B" average possibly receiving the same "sten" score as a student with a "C" average from the suburban comprehensive school. (A difference of a whole letter grade was not unusual, especially in vocationally-oriented courses and in total grade average, chiefly because the bulk of the recipients of high marks in the comprehensive schools were in college and were not subjects of the study.)

Class rank. It is consistently reported in the literature that the high school class rank is equal to or better than any other predictor of relative rank in college.[1] This is especially true when investigations are restricted to the graduates of specific high schools who attend specific colleges. The results are probably caused in part because graduates of "strong" high schools tend to attend "strong" colleges, and vice versa.

An objective of the present study was to test for predictive relationships between high school rank and subsequent success in employment, somewhat parallel to the predictive relationship between class rank and college success. The parallel relationship is thought to be that letter grades assigned by teachers or professors are a form of "ranked satisfactoriness," which roughly follow a normal distribution, and that employers can also rank small clusters of workers on their "satisfactoriness."

One potentially serious problem, involving the differences in the meaning of a particular letter grade within a high school, is thought to be controlled in this study. That is, considering two students of equal ability who attend the same high school, Student X might achieve a "C" average in the college-preparatory curriculum with greater effort than Student Y expends in achieving a "B" average in the "non-college" curriculum. However, just as most of the subjects of the studies of relationships between high school and college achievement are products of college preparatory high school curricula, the subjects of the present study are almost all products of non-college preparatory curricula.

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[1] Garrett, op. cit., pp. 91-96.

Table 10 illustrates the distributions of class ranks as percentile ranks, with conversion to "sten" scores.

English grade average. One purpose of this study was to explore the idea that most jobs include tasks or operations which relate to the worker's background in the general academic or liberal arts area of studies, and that other tasks or operations relate to the worker's training in skills and knowledge that are unique to the job at hand. English was chosen to represent the academic area for two reasons. First, English is representative of most of the "3 R's" of education ("communications competency" might have been called "basic literacy"). Second, six semesters of required English instruction have been completed by every graduate in the study.

Table 11 illustrates the distributions of English grade average with conversion to "sten" scores.

Grade average in vocationally-oriented courses. Parallel to the selection of English as an area of achievement, a purpose of this study was to explore the relationship of school achievement in vocationally-oriented courses (such as industrial arts sequences of more than one year and courses in business and distributive education) with rankings by job supervisors on the factor called "skills unique to the job."

Table 12 illustrates the distributions of grade average in vocationally-oriented courses, with conversion to "sten" scores.

Classification by school program

One primary purpose of the study was to compare the jobs and job-success of graduates who had a heavy concentration of vocationally-oriented courses in senior high school with graduates who had only a few vocationally-oriented courses or none. In order to utilize data from all subjects in the study, the graduates were classified as either "vocationally-oriented" (Group I) or as "general education" (Group II). The dividing line was arbitrarily fixed in what is essentially a continuum of background and therefore the

TABLE 10

CLASS PERCENTILE RANKS OF THE SUBJECTS, BY SCHOOLS, WITH CONVERSION TO "STENS"

School								
Urban Vocational			Urban Comprehensive			Suburban Comprehensive		
Class %ile Rank	No. of Subj.	"Sten"	Class %ile Rank	No. of Subj.	"Sten"	Class %ile Rank	No. of Subj.	"Sten"
96	1	10	85	1	10	77	1	10
95	2	9	79	1	9	69	1	9
94	1	"	67	1	"	63	1	"
92	1	8						
90	1	"	63	2	8	60	1	8
87	1	"	57	1	"	55	2	"
85	1	"	54	1	"			
80	1	"						
78	1	7	47	1	7			
77	1	"	46	1	"	52	3	7
72	1	"	44	1	"	50	1	"
70	1	"	43	2	"	46	3	"
66	4	"	41	1	"			
			40	3	"			
63	1	6				43	1	6
58	2	"	38	2	6	42	1	"
54	3	"	36	1	"	41	2	"
52	1	"	32	5	"	38	2	"
51	1	"				35	1	"
48	2	"				31	2	"
44	5	5	25	2	5	29	2	5
39	2	"	23	3	"	27	1	"
38	1	"	21	1	"	22	1	"
36	1	"	20	1	"	21	2	"
33	2	"	19	2	"	19	3	"
			18	2	"			
29	3	4						
26	1	"	16	2	4	18	3	4
25	1	"	15	1	"	14	4	"
24	1	"	14	3	"			
23	1	"						
19	5	3	11	1	3	12	1	3
15	1	"	10	2	"	10	1	"
			9	3	"	9	1	"
13	1	2	6	1	2	7	1	2
7	1	"	5	1	"			
5	2	1	3	1	1	4	2	1
	55			51			44	

TABLE 11

LETTER GRADE AVERAGES OF THE SUBJECTS, BY SCHOOLS, FOR SIX SEMESTERS OF REQUIRED ENGLISH INSTRUCTION, WITH CONVERSION TO "STEN" SCORES

School								
Urban Vocational			Urban Comprehensive			Suburban Comprehensive		
Eng. Aver.[1]	No. of Subj.	"Sten"	Eng. Aver.	No. of Subj.	"Sten"	Eng. Aver.	No. of Subj.	"Sten"
2.83	1	10	2.83	1	10	3.00	1	10
2.67	1	9	2.50	2	9	2.33	1	9
2.50	1	"	2.33	1	"			
2.17	4	8	2.17	2	8	2.00	8	8
			2.00	5	"			
2.00	10	7	1.83	4	7	1.67	4	7
						1.50	1	"
1.83	7	6	1.67	7	6	1.33+	6	6
			1.50+	5	"			
1.67	10	5	1.50-	5	5	1.33-	9	5
			1.33	7	"			
1.50	6	4	1.17	4	4	1.17	1	4
1.33	6	"				1.00	10	"
1.17	4	3	1.00	3	3			
1.00	4	2				0.83	2	2
			0.83	1	1			
	55			51			44	

[1] 3.00 = "B", 2.00 = "C", 1.00 = "D". In three instances where approximately double the normal "sten" percentages occurred in clusters with the same score, the cluster was split according to whether the English grades were ascending or descending over the 3-year period. This procedure was believed to have more merit than the usual method of alternating selections.

TABLE 12

LETTER GRADE AVERAGES IN VOCATIONALLY-ORIENTED COURSES, FOR SELECTED GRADUATES OF THREE SCHOOLS, WITH CONVERSION TO "STENS"

"Vocationally-Oriented" Grade Average	School					
	Urban Vocational		Urban Comprehensive		Suburban Comprehensive	
	No. of Subj.	"Sten"	No. of Subj.	"Sten"	No. of Subj.	"Sten"
3.30+	2	10	1	10		
3.15	4	9	2	9		
3.10			4	8		
3.05	2	8				
3.00	2	"			1	8
2.90	1	7				
2.85			1	7		
2.80	1	"				
2.75	1	"				
2.70	2	"	1	"		
2.65	3	"				
2.60					1	7
2.55			2	"		
2.50	4	"	1	"		
2.40	1	6				
2.35			1	6		
2.30	2	"	5	"	4	6
2.25			1	"	2	"
2.20	1	"				
2.15	2	"	2	"		
2.10			1	"		
2.05	1	5	1	5		
2.00	11	"	2	"	4	5
1.90	3	"				
1.85	2	4	1	4		
1.80	2	"	3	"	1	4
1.75			1	"	5	"
1.70	1	"	2	"		
1.65	3	3	1	3	2	3
1.55	1	"				
1.50	2	"	1	"	2	"
1.40					1	2
1.30			2	2	1	"
1.20	1	1				
1.15			1	1		
	55		51		44	

classification did not have the discriminating power that might have been possible if only those with the largest amount of vocationally-oriented training had been compared with others who had none.

Table 13 presents the frequencies of the "vocationally-oriented" and the "general" classifications (Groups I and II), with the "vocationally-oriented" group divided into those with jobs which are related to the training received (Group IA) and those with jobs not related to training (Group IB), with the frequencies further indicated for the three schools.

TABLE 13

CLASSIFICATION TO SUBJECTS ACCORDING TO HIGH SCHOOL PROGRAM AND WHETHER OR NOT JOBS OBTAINED ARE RELATED TO TRAINING RECEIVED

	I - Vocationally-Oriented Graduates			
Schools	IA-Jobs related to training received	IB-Jobs not related to training	Total 1A+IB (I)	II - General Education Graduates
Urban Vocational	29	26	55	
Urban Comprehensive	15	20	35	16
Suburban Comprehensive	8	14	22	22
	52	60	112	38

The subjects who had eight or more completed semesters of vocationally-oriented courses were placed in the vocationally-oriented classification on this qualification alone. A prior decision which was made in conducting the classification of graduates was the classification of each course in the curriculum into "vocationally-oriented" or "general" categories. At the vocational high school, courses were so classified by state regulation. In the comprehensive high schools, courses were identifiable by statements of purpose found in the programs of study as adopted by the subject departments within the schools. The school counselors made these designations.

Subjects who had completed five or fewer semesters of vocationally-oriented courses were classified as "general." The borderline cases, those with six or seven semesters of vocationally-oriented courses, were decided on by the school counselor, who based his judgment on whether or not the six or seven semesters contained either a concentration in one specific field (e.g., four semesters of auto mechanics plus two semesters of machine shop) or a cluster of closely related courses (e.g., two semesters of machine drafting, two of machine shop, two of industrial metals, plus one semester of shop math). In most instances, six semesters or one hour a day for three years was considered to be a proper inclusion for a general education program.

Classification of the "vocationally-oriented" graduates according to whether or not each had obtained a job related to his field of training was also made by the school counselors. The question which appears at the bottom of Form II, Appendix B, served to orient the counselors in making the classification, which was not done until the investigator had completed the interviews with the employers, so that the employers had confirmed or modified the job descriptions submitted by the subjects of the study.

The Definitions of Jobs

Of the three sets of basic variables, (a) school experience factors, (b) job definitions, and (c) success in employment, the present section pertains to (b), the job definitions, sub-divided into:

(1) job content emphases, and
(2) demandingness of job.

As noted earlier, these criteria are the result of instruments or evaluative techniques which were arbitrarily devised for the purposes of this study. They help to define in a simple manner two basic dimensions of any job: (a) the content of the job as reflected by the relative importance of three operations of the workers, and (b) the difficulty of performing the job, or the demandingness of the job on the worker's capacity.

The job-content definitions

The technique of asking each employer to define the job in question by assigning a relative order of importance of three arbitrary job-performance elements was contrived to make classifications possible in the short period of time allowed for each interview, and also to reduce the classifications to a number adaptable to chi-square tests with 150 subjects.

Each employer placed the job under discussion into one of six classifications by indicating the order of importance to the job of the three performance elements: (a) Communications Competency, (b) Personal Adequacy, and (c) Skills Unique to the Job. The factor ranked first has been termed the "emphasis" of the job. The operational definitions of these factors were given to the employers on cards, copies of which appear in Appendix B as Form IV, Part B, items 1, 2, and 3.

Rationale of the job content factors. The following rationale may help to establish the relationships of the job-content factors to school curriculum.

First, school curriculum has been defined for this study as a composite of experiences which is extremely difficult to separate into components which can be shown to have specific and measurable outcomes. The three major components have been described as intellectual and artistic development, preparation for home and civic responsibilities, and preparation for the world of work.

Second, the three elements of performance in almost any job are described, for purposes of this study, as "communications competency," "personal adequacy," and "skills unique to the job." These are arbitrarily assumed to have some degree of logical relationship to the three objectives of curriculum, which are preparation for intellectual fulfillment, social obligations, and vocational competency.

Third, obtaining a job in which one of the above factors is predominant may be related to the quantity and quality of experience in the associated areas of curriculum. Do the best students in vocationally-oriented courses get the jobs where the skills factors rank highest? Also, relative success (such as a rank given by a supervisor) may be related to the quality and quantity of school experience in the associated area. Do the best students in English tend to be ranked higher on communications competency?

The supposition of the investigator was that the outcomes were not likely to be distinguishable, but that the tests should be made, to support or not support the supposition.

Definition by "demandingness"

The classification system for placing all jobs obtained by the subjects of the study into four levels of "demandingness" was devised because a method was needed to obtain the desired information in the interviews with employers.

Each employer interviewed indicated that the job under discussion fit best into one of four classifications, arranged in a hierarchy of "demandingness." These levels were clarified by the following descriptions. (The interview form containing these descriptions appears in Appendix B as Form IV, Part A.)

a) "This is a tough job to fill for a boy just out of high school; he not only has to have specific skills but he has to be dependable and quick to learn."

b) "The boy doesn't have to have much special training other than a high school education, but he has to be dependable and quick to learn."

c) "Most high school graduates can learn to handle this job if they are honest and willing, but it does take awhile to learn the operations if they haven't learned them in school."

d) "Almost any boy can handle this job if he is honest and willing, and he can pick up all the essential operations in a few days."

Employers were assisted in making this classification by an illustration presented orally by the investigator:

> "In an automobile service station we would think of it in this way: If a boy merely pumped gas and did clean-up work he would be in the lowest classification; if he greased and serviced cars and therefore had to follow the charts for all the makes and models he would move one step higher; if he were in charge of a shift or if he had to do a variety of mechanical repairs he would be next to the top, and, if his job required that he do major repair work or keep the books for a station he would be in the top category."

It will be noted that there is no basis for assuming that the intervals between classification have equal "distance" between them; therefore, the four levels are limited in their suitability for statistical handling. It was assumed, however, that they are in proper hierarchical order and could be so treated.

The breakdown of all jobs into 24 definitions was accomplished by assigning each to a cell as illustrated in Figure 2. (The frequencies which occurred appear in Table 18.)

FIGURE 2

ILLUSTRATION FOR DEFINING JOBS ON THE DIMENSIONS OF
SEQUENCE OF IMPORTANCE OF JOB-CONTENT FACTORS AND
LEVEL OF DEMANDINGNESS

		Job Content Factors					
		CPS	CSP	PCS	PSC	SCP	SPC
Demandingness	4 (more) ↑						
	3						
	2						
	↓ 1 (less)						

Evaluations of Satisfactoriness

Of the three sets of basic variables, this section pertains to the last set, concerning success in employment, sub-divided into:

(1) rankings of satisfactoriness, and
(2) ratings as satisfactory or unsatisfactory.

Ranks on the content areas and on overall satisfactoriness

In the structured interview with employers, the investigator asked each employer to arrange slips with names of comparable workers from best to poorest on each of the job content areas--"Communications Competency," "Personal Adequacy," and "Skills Unique to the Job." This was done in the order of importance of the factors that the employer had previously designated. Next, the employer arranged the order of name slips on "Overall Satisfactoriness." It was pointed out that the last rank did not have to be an average, or reflection, of previous ranks for each worker, because of the possibility of missing factors.

The arbitrariness of this method of evaluation is acknowledged. One deficiency is the inflexibility of the definition in the matter of excluding additional factors which may be as important as the three used. Some indication of the seriousness of this deficiency was obtained by asking each employer if the three factors seem to "cover the job pretty well." Nine employers nominated "output," and four employers nominated "drive and ability to be promoted."[1] The investigator believes that most employers tended to transfer values which they sensed, but could not express, into the given factors most closely associated. It is also believed that omission of important factors in a considerable number of cases would be reflected by an appreciable difference between the average rank on the three content factors and the rank on Overall Satisfactoriness--which did not occur (perhaps because of the "halo effect" among the rankings).

Ratings as Satisfactory or Unsatisfactory

Just as the employer completed arranging the name slips for the last time (on "Overall Satisfactoriness") he was presented with the following oral statement and was asked to respond to it.

> "Sometimes even the lowest ranking worker is completely satisfactory on minimum standards and sometimes one or more are not satisfactory. In this particular case, if all of these workers somehow left this employment and then wanted the jobs back that they held at the end of their probationary period, and they were performing at the level they performed at after 90 days, where would you draw the line between those you would want back and those you would rather see work somewhere else?"

Workers above the line were marked "S", for "Satisfactory," and those below the line were marked "U", for "Unsatisfactory."

It might be argued that when all subjects of a study have met the criterion of passing a 90-day probationary period, they would all be satisfactory at a minimum level. However, on the speculation that job supervisors do not necessarily fire workers they consider to be less than competent, this rating was made to determine what proportion of the total group had passed a probationary period but was nevertheless considered to be "Unsatisfactory."

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[1] Perhaps a more serious deficiency is the lack of a weighting system to provide for the cases where the evaluation on the second-choice factor (e.g., "C" in a PCS definition) is given the same value whether it is almost as important as the first-choice factor or if it has very little importance. This is a built-in deficiency which is present in all systems where highly complex matters are classified into too-few categories, but it is necessary if analysis of small samples is to be possible.

PART THREE: THE FORMAT FOR ANALYSIS

Outline of Relationships to be Tested

The relationships to be tested fell into three groups, corresponding to the three possible combinations of the three sets of major variables described in Part Two. These are:

a) achievement and program vs. job definitions

b) job definitions vs. evaluations of satisfactoriness

c) achievement and programs vs. evaluations of satisfactoriness

These relationships can be represented by the following general statements:

a) Comparisons of the sub-sets of specific relationships between (1) school achievement or programs taken and (2) the jobs (as defined by content and demandingness) provided information concerning tendencies for graduates with certain types of school background to obtain certain types of jobs.

b) Comparisons of the sub-sets of specific relationships between (1) the jobs (as defined by content and demandingness) and (2) the rankings or ratings of satisfactoriness had no independent general hypothesis. The specific null hypothesis applied to testing relationships between each pair of variables resulted chiefly in findings which helped to interpret the relationships which have independent meaning.

c) Comparisons of the sub-sets of specific relationships between (1) school achievement or programs taken and (2) the rankings or ratings of satisfactoriness provided some insights about whether or not high school achievement can be used to predict the relative success of young workers in entry-jobs in much the same way that high school class rank can be used to predict relative success or achievement in college.

Preliminary Tests and Information

Before moving into the testing of the three major sets of variables, it became necessary to answer four preliminary questions so that the interpretations of the major tests would reflect the benefits of these prior considerations.

The four questions follow, accompanied by indications of the tests which were conducted in providing answers.

a) Do graduates of the general and vocationally-oriented programs differ significantly in achievement?

Question (a) applies only to the two comprehensive high schools because the vocational high school had no general graduates. There was no need to remove the observations from the vocational high school from the computations, however, since the "stens" assigned were all of one classification and were assigned according to the percentage formula which determined the expected frequencies.

The null hypothesis implied in the relationships tested was that there are no significant relationships to be found between general and vocationally-oriented graduates on the measures of school achievement.

The relationships tested to answer question (a) are:

(1) General or vocationally-oriented program
vs. class rank

(2) General or vocationally-oriented program
vs. English average

(3) General or vocationally-oriented program
vs. attendance record

b) Do vocationally-oriented graduates from one school fare better than graduates of other schools in obtaining jobs related to their training?

The relationship tested to answer question (b) pertains to the proportions of vocationally-oriented graduates of the three schools who did or did not obtain jobs related to their training, and it was answered through conducting the chi-square test of significant relationships outlined below.

(4) Vocationally-oriented graduates classified by
relatedness of jobs to training received
vs. school attended

c) How do the two major dimensions of the jobs relate? Which job-content factors are associated with the more-demanding or less-demanding jobs?

Answering question (c) helped to set the stage for the three major sets of tests. An answer was provided by testing the relationship between the job-content emphases (order of importance of the three job-content factors) and the demandingness levels of the jobs.

This relationship is illustrated in Figure 1, and is outlined as follows:

(5) Job content emphasis
vs. demandingness level of job

d) How consistently do employers rate workers "Unsatisfactory" who are also ranked lowest in their co-worker group on "Overall Satisfactoriness?"

A last preliminary test was made to ascertain the relationship between the two major evaluations of satisfactoriness, the rank on "Overall Satisfactoriness" and the rating as "Satisfactory" or "Unsatisfactory." It was also of interest to learn the proportion of workers who had presumably passed a probationary period who were nevertheless rated "Unsatisfactory."

The latter test is outlined as follows:

(6) Rank on "Overall Satisfactoriness"
vs. rating as "Satisfactory" or "Unsatisfactory"

School Achievement and Program
vs. Job Content and Demandingness

The first of three sets of major relationships analyzed was that which was intended to cast some light on the question: What kinds of boys get what kinds of jobs? The main assumption behind this question was that distinct relationships probably do exist between levels of school achievement and the definitions of jobs which the higher or lower achievers get. The objective of the study most closely related to this point is that of trying out the contrived methods of defining job content and demandingness.

Examples of the sub-questions were: (1) Do the higher achievers in English tend to get the jobs where Communications Competency is valued most? (2) Do those with the best attendance records tend to hold jobs where Personal Adequacy is valued most? (3) What kind of achievement, if any, tends to relate to higher or lower demandingness levels of jobs?

Similarly, the subjects from vocationally-oriented programs were compared to those from the general programs, to see which ones might tend to get jobs with certain definitions according to content or demandingness. Finally, the vocationally-oriented classification was sub-divided into those with and without jobs related to school training, and these sub-divisions were compared.

The four sub-sets of relationships which were examined are outlined below.

a) Relationships between the school achievement measures and the job-content designations:

(1) Class rank
vs. job content;

(2) Grade average in required English courses
vs. job content;

(3) Grade average in vocationally-oriented courses
vs. job content;

(4) Attendance record
vs. job content.

b) Relationships between the school achievement measures and the demandingness of jobs:

(1) Class rank
vs. demandingness;

(2) Grade average in required English courses
vs. demandingness;

(3) Grade average in vocationally-oriented courses
vs. demandingness;

(4) Attendance record
vs. demandingness.

c) The relationship between the school program and the job-content designation.

d) The relationship between the school program and the demandingness of jobs.

e) The relationship between having or not having a job related to training received (vocationally-oriented only) and the school achievement measures:

  (1) Vocationally-oriented graduates classified by
      relatedness of jobs to training received
    vs. class rank;

  (2) Vocationally-oriented graduates classified by
      relatedness of jobs to training received
    vs. English grade average;

  (3) Vocationally-oriented graduates classified by
      relatedness of jobs to training received
    vs. grade average in vocationally-oriented subjects;

  (4) Vocationally-oriented graduates classified by
      relatedness of jobs to training received
    vs. attendance.

The Job Definitions

vs. Evaluations of Satisfactoriness

The second of three sets of major variables tested for significant relationships was that which related the job definitions (job-content and demandingness) to the evaluations of success in employment (rankings on satisfactoriness and rating of satisfactory or unsatisfactory).

The sub-sets of specific relationships which were tested are:

a) Relationship between the job content disignations and the satisfactoriness rankings:

  (1) Job content
    vs. rank on Communications Competency:

  (2) Job content
    vs. rank on Personal Adequacy:

(3) Job content
    vs. rank on Skills Unique to the Job;

(4) Job content
    vs. rank on Overall Satisfactoriness.

b) Relationships between the demandingness designations and the satisfactoriness rankings:

(1) Demandingness
    vs. rank on Communications Competency:

(2) Demandingness
    vs. rank on Personal Adequacy;

(3) Demandingness
    vs. rank on Skills Unique to the Job:

(4) Demandingness
    vs. rank on Overall Satisfactoriness;

c) The relationship between the job content designation and the Satisfactory or Unsatisfactory rating.

d) The relationship between the demandingness designation and the Satisfactory or Unsatisfactory rating.

As in the case of relationships between the job definitions and achievement and programs taken, the relationships listed in this second set had value in setting the stage for interpretation of the relationships which were most central to the study--achievement vs. satisfactoriness.

The relationships with the satisfactory-unsatisfactory rating reflected a somewhat different dimension. Where the rankings were limited to indicating the subject's position in his own co-worker group (where an excellent worker among other excellent workers may be ranked "average" and a poor worker among other poor workers may be ranked "average") the "satisfactory-unsatisfactory" classification was presumed to indicate the employer's satisfaction with his employee on a more "absolute" basis. It is thought to be an indication of whether or not the employer has taken the trouble to recruit and retain workers he is pleased with, and/or whether or not he dismisses those he is not pleased with.

Testing the relationships indicated in (c), above, was designed to test a supposition that one or more types of jobs (as identified by the content classifications) tend to be associated with employers who are dissatisfied with their workers. Testing the relationships indicated in (d), above, was designed to test a supposition that jobs which are higher or lower in how demanding they are of the worker tend to be associated with employers who are happy or unhappy with their workers with disproportionate frequency.

School Achievement and Programs vs. Evaluations of Satisfactoriness

The third set of relationships focused directly on the central problem of the study--particularly on the relationship between achievement and satisfactoriness.

Figure 3 illustrates the relationships involved when school programs were compared to satisfactoriness in employment.

The following outline of specific relationships which were tested between school programs and satisfactoriness contains all combinations which were considered to be potentially meaningful. General education graduates were not involved in tests comparing subjects with and without jobs related to high school training.

a) Relationships between the school program taken and the satisfactoriness rankings:

   (1) Vocationally-oriented or general program
   vs. rank on Communications Competency;

   (2) Vocationally-oriented or general program
   vs. rank on Personal Adequacy;

   (3) Vocationally-oriented or general program
   vs. rank on Skills Unique to the Job;

   (4) Vocationally-oriented or general program
   vs. rank on Overall Satisfactoriness;

   (5) Vocationally-oriented graduates classified by relatedness of jobs to training received
   vs. rank on Skills Unique to the Job:

   (6) Vocationally-oriented graduates classified by relatedness of jobs to training received
   vs. rank on Overall Satisfactoriness

b) Relationships between the school program taken and the Satisfactory or Unsatisfactory rating:

   (1) Vocationally-oriented or general program
       vs. Satisfactory or Unsatisfactory;

   (2) Vocationally-oriented graduates classified by relatedness of jobs to training received
       vs. Satisfactory or Unsatisfactory.

Figure 4 illustrates the relationships involved when measures or indicators of high school achievement are compared to satisfactoriness in employment.

Sections (c) and (d) of the outline, below, pertain to the relationships illustrated in Figure 4.

c) Relationships between the school achievement measures and the satisfactoriness rankings:

   (1) Class rank
       vs. rank on Communications Competency;

   (2) Class rank
       vs. rank on Personal Adequacy;

   (3) Class rank
       vs. rank on Skills Unique to the Job;

   (4) Class rank
       vs. rank on Overall Satisfactoriness;

   (5) Grade average in required English courses
       vs. rank on Communications Competency;

   (6) Grade average in required English courses
       vs. rank on Personal Adequacy;

   (7) Grade average in required English courses
       vs. rank on Skills Unique to the Job;

   (8) Grade average in required English courses
       vs. rank on Overall Satisfactoriness;

   (9) Grade average in vocationally-oriented courses[1]
       vs. rank on Communications Competency;

---

[1] General education graduates are not involved in relationships (9), (10), (11), and (12).

FIGURE 3

THE RELATIONSHIP BETWEEN THE SCHOOL PROGRAM AND JOB OBTAINED AND THE EMPLOYER EVALUATION OF SATISFACTORINESS

		School Program			
		Vocationally-Oriented			General Education
		Jobs Related to Training	Jobs Not Related	Total	
Rank (score) on Content Factors	7				
	6				
	5				
	4				
Rating	S				
	U				

FIGURE 4

THE RELATIONSHIP BETWEEN THE SCHOOL ACHIEVEMENT INDICATORS AND THE EMPLOYER EVALUATION OF SATISFACTORINESS

		Indications of Achievement			
		Class Rank	English Ave.	Voc-Or. Ave.	Attendance
Rank (score) on Content Factors	7				
	6				
	5				
	4				
Rating	S				
	U				

(10) Grade average in vocationally-oriented courses
vs. rank on Personal Adequacy;

(11) Grade average in vocationally-oriented courses
vs. rank on Skills Unique to the Job;

(12) Grade average in vocationally-oriented courses
vs. rank on Overall Satisfactoriness;

(13) Attendance record
vs. rank on Communications Competency;

(14) Attendance record
vs. rank on Personal Adequacy;

(15) Attendance record
vs. rank on Skills Unique to the Job;

(16) Attendance record
vs. rank on Overall Satisfactoriness.

d) Relationships between the school achievement measures and the Satisfactory or Unsatisfactory ratings:

(1) Class rank
vs. Satisfactory or Unsatisfactory;

(2) Grade average in required English courses
vs. Satisfactory or Unsatisfactory;

(3) Grade average in vocationally-oriented courses
vs. Satisfactory or Unsatisfactory;

(4) Attendance record
vs. Satisfactory or Unsatisfactory.

The procedure in testing the relationships listed above was to first test the "satisfactory and unsatisfactory" and "overall satisfactoriness" variables against each of the four achievement measures. Next, the logically related pairs were tested.

Testing for Differences in Recruitment and Selection Procedures

As noted earlier, one of the limitations of the study is that in comparing any two places of employment, where the workers do an identical job, the standards of selection might be high in one place and low in the other. Consequently, all workers might be satisfactory in the place which selected "carefully," and one or more might be unsatisfactory in the place which selected "carelessly."

This concept was used and tested in two ways. First, the standard scores assigned to the rankings on job performance were adjusted somewhat, favoring those selected carefully, to discover if this might have resulted in a closer relationship between rank on job performance and scores on predictor factors. Second, the top fourth or third (on the variable of how carefully or carelessly selected were the workers) was compared with the bottom fourth or third, to discover if these groups were distinguishable on any of several factors which might be meaningful.

Selecting the high and low groups on carefulness of selection was accomplished by an arbitrary formula. The "carefully selected" group was composed of those workers who were not only interviewed, but where the employer also had contacted the school for a recommendation, and/or had required that applicants have a particular vocational course background, and/or had administered appropriate screening tests. The "carelessly selected" group was composed of those who had come to the employer ("walked in") without being recruited through either schools or employment offices, and in addition were interviewed only, with no tests or other screening devices or checking of references.

Comparing Principal Subjects with Co-Workers

One of the assumptions of the study as described thus far was that the co-workers would be "comparable" to the principal subjects. After the initial data on the 150 principal subjects were analyzed, selected data on a sample of 90 of the co-workers were gathered, and tests were conducted which helped to answer the following questions:

a) Are the co-workers who do the same work as the principal subjects approximately equal, as a group, to the principal subjects, as measured by I.Q., attendance record in school, and the Differential Aptitude Tests? (The co-workers used were those who graduated from high school in 1962, 1963, and 1964, so that age differences would be minimized.)

b) Are the ranks and ratings of job performance approximately equal, comparing the co-worker and principal subject groups?

CHAPTER IV

FINDINGS AND INTERPRETATIONS

Introduction to Chapter IV

The statistical findings of the study are given in the present chapter, along with interpretations as they seem appropriate. Tables are inserted when they serve as necessary visual aids to the text; tables are relegated to the Appendix if their primary function is to serve as possible references.[1]

It should be noted again that the findings and interpretations of this study should not be considered as "conclusions" in the usual sense. The term "interpretations" was selected as a replacement for "conclusions" in the chapter title for this reason. A combination of limitations--of measuring instruments and of an artificially structured "sample"--restricted the conclusions of this study to a pilot level, i.e., to supporting or not supporting hypotheses for further testing. (As a pilot study, the proper conclusions are to be found in the Recommendations for Further Study, in Chapter V.)

In the sections of the chapter which follow, the topics are presented in the following sequence:

First, preliminary tests and information;

Second, relationships between:
school achievement or programs
and the jobs (defined by content and demandingness);

Third, relationships between:
the jobs (defined by content and demandingness)
and satisfactoriness (as evaluated by employers);

Fourth, relationships between:
school achievement or programs
and satisfactoriness (as evaluated by employers);

---

[1] Tables are numbered 1A, 2A,..... nA, in the Appendix. All tables which pertain to the tests between the three major sets of relationships, identified as I, II, and III in this chapter, appear in Appendix A, and some are repeated in the text.

Fifth, comparisons of co-workers to the original group of 150, plus relationships between selection procedures and other variables

Sixth, interpretations of combinations of findings.

Preliminary Tests and Information

Certain findings concerning relationships between the members of each major pair of variables provided information which helped to set the stage for the tests of relationships between the sets of variables.

In regard to the school experience factors, tests were conducted to ascertain relationships between (1) the school program emphasized by the graduates, and (2) the measures of achievement and attendance.

Concerning the job definitions, tests were conducted to ascertain relationships between (1) the job-content emphases, and (2) the demandingness of jobs.

In regard to the evaluations of satisfactoriness, a test was conducted to ascertain the relationship between (1) the ranking on "Overall Satisfactoriness" and (2) the rating of "Satisfactory" or "Unsatisfactory."

Achievement of general vs. vocationally-oriented graduates

The assumption that the selected school groups are similar (demonstrated as reasonable and partially tested as shown in Chapter III), made it possible to test a dependent assumption, that the general and vocationally-oriented groups are approximately equal in the measures or indicators of school achievement--including attendance.

Chi-square tests were conducted, based on null hypotheses that there are no significant relationships between the school program taken and the measures of school experience.

Findings

Achievement measures vs. voc-oriented or general	X^2	d.f.	p	Sig.	Table No.
Class rank	8.365	5	$.25 > p > .10$	No	14
English average	5.083	5	$.50 > p > .25$	No	15
Attendance	0.873	5	$.975 > p > .95$	No	16

The null hypotheses of no significant relationships were accepted.

Tables 14, 15, and 16 illustrate the frequencies by which the tests were computed. No test was made in regard to grade average in vocationally-oriented courses because no average was obtained for the general graduates in these courses.

Interpretation

The findings tend to support the supposition that the general and vocationally-oriented graduates in this study, selected on the defined criteria, do not differ appreciably, as groups, on either the high school class rank or the average of letter grades in six semesters of English. The borderline finding for class rank suggests that the higher grade averages which the vocationally-oriented group tended to receive in vocationally-oriented courses were affecting their class ranks in their favor. (Compare Tables 10 and 12, in Chapter III.) But since the general group had no vocationally-oriented course average this could not be tested directly. The attendance factor is very clearly a non-relationship. (Attendance, in other contexts, tends to be less consistent with other measures.)

Comparing schools on jobs obtained by graduates

If neither schools nor school programs differ on the achievement measures (as it appeared at this point in the study--pertaining to the subjects of the study), a related question was: Do the graduates of any of the schools fare better than the others in obtaining jobs which are related to the vocationally-oriented training received in high school?

Table 13 illustrated the proportions of vocationally-oriented graduates from the three schools who obtained jobs related to the training received. A test was conducted and is reported below

TABLE 14

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM AND CLASS RANK AT GRADUATION

Class Rank (in "stens")	School Program Emphasized	
	Vocationally-Oriented	General
8	13	9
7	15	9
6	25	3
5	24	8
4	15	5
3	20	5
	112	38

$X^2 = 8.365$ d.f. = 5 $.25 > p > .10$

TABLE 15

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM AND GRADE AVERAGE IN ENGLISH COURSES

English Average (in "stens")	School Program Emphasized	
	Vocationally-Oriented	General
8	17	11
7	16	5
6	21	5
5	23	8
4	20	7
3	15	2
	112	38

$X^2 = 5.083$ d.f. = 5 $.75 > p > .50$

TABLE 16

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN
HIGH SCHOOL PROGRAM AND
RECORD OF SCHOOL ATTENDANCE

Attendance (in "stens")	School Program Emphasized: Vocationally-Oriented	General
8	19	5
7	13	6
6	24	7
5	20	7
4	18	6
3	18	7
	112	38

$X^2 = 0.873$ d.f. = 5 $.975 > p > .95$

concerning whether or not the proportion in related jobs compared to those in non-related jobs represents a statistically significant relationship. This information had some bearing on how subsequent findings were interpreted.

The null hypothesis was that there is no significant relationship between the jobs-training classification and the school attended.

Finding re school attended and jobs related or not to training

$X^2 = 1.953$ d.f. = 2 $.50 > p > .25$

The null hypothesis of no significant relationship was accepted.

Table 17 illustrates the observed frequencies associated with the above finding.

TABLE 17

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOBS TO TRAINING RECEIVED AND HIGH SCHOOL ATTENDED

	Vocationally-oriented graduates	
School	Jobs related to training received	Jobs not related to training
Urban Vocational	29	26
Urban Comprehensive	15	20
Suburban Comprehensive	8	14

$X^2 = 1.953$ d.f. = 2 $.50 > p > .25$

Interpretation

The finding tends to support the supposition that the school attended does not appreciably affect the process of obtaining jobs related to training received. Slight irregularities between observed and expected frequencies in cells of the chi-square table favor the urban vocational school. (The availability of more extensive job placement facilities in the vocational high school would lead one to expect some advantage in placement.) This finding also tends to reinforce the basic assumption of the similarity of the school-groups.

Relationship between the two job-definition dimensions

Figure 1 (in Chapter III) provided the framework for classifying all jobs by assigning six possible rank orders (of importance to the employer) to the job-content factors, plus four levels of demandingness of the jobs. The result was a grid with 24 cells, each comprising a job definition based on two major dimensions of all jobs. If numbers of subjects had been greater, chi-square tests based on 24 cells could have been made.

It can be seen in Table 18 that if a chi-square test were made too many cells in the expected frequency table would contain frequencies of less than 5. Therefore, no tests were made using data distributed as shown in Table 18. Instead, it was necessary to group the two types of jobs where the employer ranked "Communications Competency" as first in importance. This caused the distinction to be lost between jobs where the order of factor-importance could be symbolized as CPS and CSP. These both became jobs where the "C" factor was emphasized. The same operation was performed for jobs where the order of factor-importance was SCP and SPC. These both became jobs where the "S" factor was emphasized, for "Skills Unique to the Job." The numbers of jobs where the order of factor-importance was PCS and PSC were large enough to preserve their identities. The symbols, however, were shortened to "Pc" and "Ps," denoting the major emphases as "Personal Adequacy" first in both instances, and "Communications..." or "Skills..." second, respectively.

Finding re job-content vs. demandingness

$X^2 = 43.479$ d.f. = 6 $p < .001$

The null hypothesis that there was no significant relationship between the job-content emphasis and the demandingness was rejected.

Table 18 follows the structure of Figure 1 in registering the frequencies for the 24 cells.

Table 19 registers the frequencies of the two-dimensional job-definitions after the cells had been reduced from 24 to 12.

TABLE 18

OBSERVED FREQUENCIES OF 150 ENTRY-JOBS DEFINED BY
SIX JOB-CONTENT EMPHASES AND
FOUR LEVELS OF DEMANDINGNESS

Levels of Demandingness	Sequences of Importance of Content Factors					
	CPS	CSP	PCS	PSC	SCP	SPC
4 (more)	3	2	1	2	5	2
3	13	1	11	2	1	2
2	19	2	25	12	3	2
1 (less)	2	--	13	25	--	2
	37	5	50	41	9	8

TABLE 19

OBSERVED FREQUENCIES OF 150 ENTRY-JOBS DEFINED BY FOUR JOB-CONTENT EMPHASES AND THREE LEVELS OF DEMANDINGNESS

Levels of Demandingness	Job Content Emphases			
	C	Pc	Ps	S
3 (more)	19	12	4	10
2	21	25	12	5
1 (less)	2	13	25	2
	42	50	41	17

$X^2 = 43.479$ d.f. = 6 $p < .001$

Interpretation

The jobs where "Communications Competency" and "Skills Unique to the Job" were ranked first in importance by employers tended to be the average and more-demanding jobs, as demandingness was defined and scaled in the study. The least-demanding jobs, on the other hand, tended distinctly to be the jobs where "Personal Adequacy" was ranked first in importance with "Skills Unique to the Job" ranked second. Jobs which were characterized as those with "Personal Adequacy" ranked first and "Communications Competency" second tended to be average in demandingness. These tendencies may provide some clues for further study of curriculum needs for the types of boys who tend to obtain certain types of jobs after graduation.

Relationship between two evaluations of satisfactoriness

The last in the series of preliminary tests concerned the relationship between the ranking on "Overall Satisfactoriness" and the rating as "Satisfactory" or "Unsatisfactory."

A chi-square test is reported in Table 20, but is meaningless because the definition of the procedure for determining the "Satisfactory"-"Unsatisfactory" rating determined that all "Unsatisfactory" workers would be low-ranked. However, the table is presented to appraise the frequency with which lowest-ranked workers were nevertheless "Satisfactory" and also the frequency with which "Unsatisfactory" workers were nevertheless ranked higher than the lowest in the group. Of most importance, it was desired that the proportion who had worked 90 days or more but had not been fired be determined.

TABLE 20

EMPLOYERS' RATINGS OF "SATISFACTORY" AND "UNSATISFACTORY" AND RANKINGS ON "OVERALL SATISFACTORINESS"

Entry-job Rank (score) on "Overall Satisfactoriness"	Employer's Rating	
	Satisfactory	Unsatisfactory
7 (higher)	24	1
6	43	--
5	30	5
4 (lower)	10	36
	107	42

$X^2 = 84.423$ d.f. = 3 $p < .001$

Interpretation

The most important information provided by Table 20 is that 42 subjects--almost one-third--were considered to be "Unsatisfactory" by their employers even though they had passed the usual probationary period and had not been fired. (A few of these were fired after four or more months, it was learned in the interviews.)

Thirty-six of the 42 "Unsatisfactory" subjects had the lowest standardized score which was given. Five more were probably workers in groups where more than the lowest-ranked member were "Unsatisfactory." Among the "Satisfactory" subjects, ten received the lowest ranking, but these were probably members of groups where the employer considered all members, at least all of the principal subjects, to be "Satisfactory."

Two peculiarities of the distributions of rank-scores, which may be seen in several tables, should be noted in connection with this first table in which they appear. If the co-worker groups had included some with eight or more workers to be ranked, the range of scores would have been from 3 to 8. But the maximum size was six. It may be noted that greater proportions appear in connection with scores of 4 and 6. This is a result of moving scores to the lower alternative when they fell at midpoints and when the cluster had an "Unsatisfactory" worker. Also, the 4's appeared to be assigned more heavily to the principal subjects with the necessary implication that co-workers were assigned the 7's in unexpectedly large numbers.

Relationships Between School Achievement or Programs and Job Definitions

(I)*

The findings reported in this first of three major sets of relationships involve tests of relationships between (1) school background (the achievement measures and the program emphasized) and (2) the jobs (defined by relative importance of the three content areas plus the designated levels of demandingness).

The present section (I) features comparisons of the sub-sets of specific relationships between (1) the achievement measures or programs taken and (2) the jobs as defined by content and/or demandingness. The purpose is to report information concerning tendencies for graduates with certain types of school background to obtain certain types of jobs.

Specific null hypotheses were implied for the several pairs of specific variables tested. This breakdown is indicated by the outline which follows, in which the statistical findings of the chi-square tests of significant relationships are reported.

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*All tables which pertain to the tests of relationships reported in the sections headed (I), (II), and (III) appear in Appendix A, including duplicates of those which appear in the context of these sections. Tables which have appeared previous to this notation are not duplicated in Appendix A.

a) Findings re school achievement vs. job content

(1) Class rank
vs. job content:

Null hypothesis accepted; $X^2 = 19.260$ d.f. = 15
$.25 > p > .10$ (Table 21)

(2) English grade average
vs. job content:

Null hypothesis accepted; $X^2 = 20.892$ d.f. = 15
$.25 > p > .10$ (Table 22)

(3) Vocationally-oriented average
vs. job content:

Null hypothesis accepted; $X^2 = 8.043$ d.f. = 15
$.95 > p > .90$ (Table 5A)

(4) Attendance record
vs. job content:

Null hypothesis accepted; $X^2 = 11.586$ d.f. = 15
$.75 > p > .50$ (Table 6A)

Interpretation

None of the measures of school achievement were related significantly to the job-content factor of the job definition. This apparently means that each type of job (regarding content) has workers who are distributed widely on each of the achievement measures. The irregularity of the observed frequencies which made the probability approach .10 on the class rank and English comparisons was that a few more subjects had jobs emphasizing "Communications Competency," along with higher grades.

A less conservative interpretation of significance levels might have allowed an interpretation that the higher achievers in the academic areas tend to get jobs where "Communications Competency" is valued most, and that having a good attendance record has no observable relationship to the job-content emphasis. The highest achievers in vocationally-oriented courses also appear to have more jobs where "Skills..." were valued most, but the frequencies in the "Skills..." column are too small to affect the chi-square outcome very much.

Tables 21 and 22 illustrate the findings related to the first and second tests under a), above, from which some clues may be obtained for seeking relationships, perhaps through use of more sensitive instruments which might be developed.

TABLE 21

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL CLASS RANK AND JOB CONTENT EMPHASIS

Class Rank (in "stens")	Job Content Emphasis			
	C	Pc	Ps	S
8	10	7	2	3
7	8	7	7	2
6	11	11	4	2
5	6	8	12	5
4	4	9	6	1
3	3	8	10	4
	42	50	41	17

X^2 = 19.260 d.f. = 15 $.25 > p > .10$

TABLE 22

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL GRADE AVERAGE IN ENGLISH AND JOB CONTENT EMPHASIS

English Average (in "stens")	Job Content Emphasis			
	C	Pc	Ps	S
8	11	10	3	4
7	8	5	4	4
6	5	7	10	4
5	10	11	9	1
4	6	13	6	2
3	2	4	9	2
	42	50	41	17

X^2 = 20.892 d.f. = 15 $.25 > p > .10$

b) Findings re school achievement vs. demandingness

(1) Class rank
vs. demandingness:

Null hypothesis rejected; $X^2 = 28.556$ d.f. = 10
$p < .005$ (Table 23)

(2) English grade average
vs. demandingness:

Null hypothesis rejected; $X^2 = 27.577$ d.f. = 10
$p < .005$ (Table 24)

(3) Vocationally-oriented average
vs. demandingness:

Null hypothesis rejected; $X^2 = 20.972$ d.f. = 10
$p < .025$ (Table 9A)

(4) Attendance record
vs. demandingness:

Null hypothesis accepted; $X^2 = 9.265$ d.f. = 10
$.75 > p > .50$ (Table 10A)

Interpretation

The findings tended to support the supposition that the more-demanding jobs tended to be obtained by graduates who had achieved the higher class ranks and higher grade averages in English.

Grade average in vocationally-oriented courses also had, in these findings, a significant positive relationship to job demandingness.

The attendance record showed no significant relationship to the demandingness of jobs. (Apparently the employers associated with the more-demanding jobs made no greater effort to check school attendance records than did the employers for the less-demanding jobs.)

Tables 23 and 24 illustrate the findings related to the first two tests under b), above, which produced the most distinct results.

TABLE 23

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL CLASS RANK AND DEMANDINGNESS LEVEL OF ENTRY-JOB

Class rank (in "stens")	Demandingness of Job (less) 1	2	(more) 3
8	3	5	14
7	3	12	9
6	4	16	8
5	11	14	6
4	10	7	3
3	11	9	5
	42	63	45

$X^2 = 28.556$ d.f. = 10 $p < .005$

TABLE 24

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL GRADE AVERAGE IN ENGLISH AND DEMANDINGNESS LEVEL OF ENTRY-JOB

English Average (in "stens")	Demandingness of Job (less) 1	2	(more) 3
8	4	9	15
7	4	6	11
6	8	9	9
5	10	16	5
4	7	15	5
3	9	8	--
	42	63	45

$X^2 = 27.577$ d.f. = 10 $p < .005$

c) Findings re school program vs. job content

(1) General or vocationally-oriented program vs. job content:

Null hypothesis accepted; $X^2 = 4.228$ d.f. = 3
$.50 > p > .25$ (Table 25)

(2) Vocationally-oriented graduates classified by relatedness of job to training received vs. job content:

Null hypothesis rejected; $X^2 = 12.336$ d.f. = 3
$p > .01$ (Table 26)

Interpretation

There were no significant differences between the general graduates and the vocationally-oriented graduates, as groups, as to whether employers placed greater value on the factors of Communications Competency, Personal Adequacy, or Skills Unique to the Job.

However, in comparing the vocationally-oriented graduates who had obtained jobs related to training received and those without jobs related to training, significant relationships were registered. The differences concentrated in two of the four job-types: In the jobs where the "Skills..." factor was valued most, the observed frequency of having a job related to training was almost twice that expected by chance, as seen in Table 26. In "Pc" jobs, where "Personal Adequacy" was valued most and "Communications Competency" second, the observed frequency of having a job related to training was 25, compared to an expected frequency of 18.

Tables 25 and 26 illustrate the findings concerning school program vs. job content.

TABLE 25

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM EMPHASIZED AND JOB-CONTENT EMPHASIS

Job-Content Emphasis	Vocationally-Oriented	General Education
C	30	12
Pc	35	15
Ps	31	10
S	16	1
	112	38

$X^2 = 4.228$ d.f. = 3 $.50 > p > .25$

TABLE 26

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOBS TO TRAINING RECEIVED AND JOB-CONTENT EMPHASIS

	Vocationally-oriented graduates	
Job-Content Emphasis	Job related to training received	Jobs not related to training
C	14	16
Pc	10	25
Ps	15	16
S	13	3
	52	60

$X^2 = 12.337$ d.f. = 3 $p < .01$

d) Findings re school program vs. demandingness

(1) General or vocationally-oriented program vs. demandingness of jobs:

Null hypothesis accepted; $X^2 = .337$ d.f. = 2
$.99 > p > .98$ (Table 13A)

(2) Vocationally-oriented graduates classified by relatedness of job to training received vs. demandingness of jobs:

Null hypothesis rejected; $X^2 = 17.205$ d.f. = 2
$p < .001$ (Table 14A)

Interpretation

The general and vocationally-oriented groups were not found to be appreciably different in distributions of the demandingness factor of the jobs. However, a distinct difference registered between sub-groups of the vocationally-oriented classification; those who had jobs which were related to school training received tended to be in the more-demanding jobs, and vice-versa.

e) Relationships between vocationally-oriented graduates classified by relatedness of job to training received and the school achievement measures

(1) Vocationally-oriented graduates classified by relatedness of job to training received vs. class rank:

Rejection of the null hypothesis remains in doubt;
$X^2 = 10.706$ d.f. = 5
$.10 > p > .05$ (Table 15A)

(2) Vocationally-oriented graduates classified by relatedness of job to training received vs. grade average in English:

Null hypothesis accepted; $X^2 = 2.603$ d.f. = 5
$.90 > p > .75$ (Table 16A)

(3) Vocationally-oriented graduates classified by
relatedness of job to training received
vs. grade average in vocationally-oriented courses:

Null hypothesis rejected; $X^2 = 15.182$ d.f. = 5
$p < .01$ (Table 27)

(4) Vocationally-oriented graduates classified by
relatedness of job to training received
vs. attendance record:

Null hypothesis accepted; $X^2 = 1.241$ d.f. = 5
$.95 > p > .90$ (Table 18A)

Table 27 illustrates the findings pertaining to test (3) above.

TABLE 27

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOBS TO TRAINING RECEIVED AND HIGH SCHOOL GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES

Voc-Oriented Average (in "stens")	Vocationally-oriented graduates: Jobs related to training received	Vocationally-oriented graduates: Jobs not related to training
8	11	6
7	14	4
6	8	15
5	9	10
4	6	14
3	4	11
	52	60

$X^2 = 15.181$ d.f. = 5 $p < .01$

Interpretation

It is clear that having higher grades in vocationally-oriented courses is positively related to having a job which is related to training received in high school (test 3). Therefore, doing well in vocationally-oriented courses seems to help predict getting a related job.

On the other hand, English grades (test 2) have no appreciable relationship to getting a job related to training, and the dubious relationship with class rank (test 1) is very likely a reflection of the relationship with vocationally-oriented courses, as these courses make up one-fourth to one-half of the total courses which result in the class rank.

Relationships Between the Job Definitions and the Evaluations of Satisfactoriness

(II)

The findings reported in this second of three major sets of relationships tested involve relationships between (1) the jobs, as defined by content and demandingness and (2) the employers' evaluations, that is, rankings of employee satisfactoriness on the job-content emphases plus the rating as "Satisfactory" or "Unsatisfactory."

No broad hypothesis was involved in conducting the second set of tests. The chief purpose was to set the stage for better interpretation of the relationships in the third set--which concerns achievement and program vs. rankings and ratings of satisfactoriness. This objective was achieved in two parts.

First, the tests of relationships between (1) job-content or demandingness and (2) rankings on satisfactoriness were in a sense a validity test--of whether the 150 principal subjects were representative of all workers ranked. This occurred because every cluster of workers had to be assigned approximately the same distribution of rank (scores), in that ranking and then transforming ranks to standard scores implies this. The only factor other than chance which could have caused significant relationships to show up in this situation was the possibility that some types of jobs, of certain content or demandingness designations, could have significant numbers of co-workers who were unlike the principal subjects in ways associated with the selective criteria. For example, if the most-demanding jobs, or the jobs for which employers valued the "Skills..." factor most, had significantly more than the expected proportions of the 150 principal subjects ranked lowest or highest, this would have registered in the form of significant chi-square findings.

Second, tests of relationships between (1) job-content or demandingness and (2) the rating of "Satisfactory" or "Unsatisfactory" were conducted to discover if significantly different proportions of employers associated with the various types of jobs tended to be satisfied or dissatisfied with their lower-ranked workers. For example, it is conceivable that the most-demanding jobs in which "Skills..." are valued most could tend to be filled by a quality of worker unsuited to satisfactory performance--compared to other job definitions.

Each test indicated in the outline which follows was based on the null hypothesis that there are no significant relationships between the variables.

a) Findings re job content vs. satisfactoriness rankings

(1) Job-content vs. rank on Communications Competency:

Null hypothesis accepted; $X^2 = 9.864$ d.f. = 9
$.50 > p > .25$ (Table 19A)

(2) Job-content vs. rank on Personal Adequacy:

Null hypothesis accepted; $X^2 = 7.365$ d.f. = 9
$.75 > p > .50$ (Table 20A)

(3) Job-content vs. rank on Skills Unique to the Job:

Null hypothesis accepted; $X^2 = 7.537$ d.f. = 9
$.75 > p > .50$ (Table 28)

(4) Jcb-content vs. rank on Overall Satisfactoriness:

Null hypothesis accepted; $X^2 = 6.531$ d.f. = 9
$.75 > p > .50$ (Table 22A)

Interpretation

The findings do not support a supposition that certain types of jobs had a greater than average proportion of workers filling them who could not meet a "Satisfactory" standard. This finding relates to a specific objective of the study, which was to discover if jobs emphasizing industrial skills might not tend to recruit more than their share of low-ability people, mainly because of greater specific efforts made by schools to train and place these people, compared with the jobs where "Communications Competency" or "Personal Adequacy" is valued most.

The lack of support for the above supposition does not mean the tendency noted may not exist in some degree. The investigator became aware during the interviews with employers that a few subjects who had less-demanding jobs were subjects who had been vocationally-oriented and had initially obtained jobs which were of high-demandingness and which were related to training received. They had been dismissed from these jobs after one or two months and then obtained the less-demanding jobs which were not related to training received.

To arrive at a more conclusive outcome on this question would require a sample containing a larger number of the more-demanding jobs which stress the "Skills..." factor (only 10 jobs of this description appear in Table 19), so that this particular group could be separately analyzed in regard to aptitudes, school achievement, and evaluations of satisfactoriness. Jobs from which workers had been fired before 90 days would also have to be taken into account.

Table 28, pertaining to ranks on the "Skills..." factor is presented below to illustrate the series of tests under section a).

TABLE 28

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN JOB-CONTENT EMPHASIS AND RANK ON "SKILLS UNIQUE TO THE JOB"

Rank (score) on "Skills Unique to the Job"	Job-content emphasis			
	C	Pc	Ps	S
7	8	14	5	5
6	11	10	13	4
5	11	12	15	3
4	12	14	8	5
	42	50	41	17

$X^2 = 7.537$ d.f. = 9 $.75 > p > .50$

b) Findings re demandingness of jobs vs. satisfactoriness rankings

(1) Demandingness vs. rank on Communications Competency:

Null hypothesis accepted; $X^2 = 5.015$ d.f. = 6
$.75 > p > .50$ (Table 23A)

(2) Demandingness vs. rank on Personal Adequacy:

Null hypothesis accepted; $X^2 = 7.067$ d.f. = 6
$.50 > p > .25$ (Table 24A)

(3) Demandingness vs. rank on Skills Unique to the Job:

Null hypothesis accepted; $X^2 = 8.615$ d.f. = 6
$.25 > p > .10$ (Table 29)

(4) Demandingness vs. rank on Overall Satisfactoriness:

Null hypothesis accepted; $X^2 = 7.148$ d.f. = 6
$.50 > p > .25$ (Table 26A)

Interpretation

The findings tended to support the supposition that the harder and easier jobs involve approximately equal proportions of workers who are ranked higher or lower on each of the evaluative criteria. Some irregularities between observed and expected frequencies were noted at the extremes--fewer were ranked lowest in the easiest jobs and more were ranked highest in the harder jobs. They deserve mention because they are consistent in direction.

Table 29 presents the frequencies observed in the third test, pertaining to ranks on the "Skills..." factor, on which some irregularities may be seen.

TABLE 29

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN DEMANDINGNESS OF JOB AND RANK ON "SKILLS UNIQUE TO THE JOB"

Rank (score) on "Skills Unique to the Job"	Demandingness of Job (less) 1	2	(more) 3
7	7	11	14
6	16	15	7
5	11	18	12
4	8	19	12
	42	63	45

$\chi^2 = 8.615$ d.f. = 6 $.25 > p > .10$

c) Findings re rating as Satisfactory or Unsatisfactory vs. job-content

Null hypothesis accepted; $\chi^2 = 2.818$ d.f. = 3
$.50 > p > .25$ (Table 30)

Interpretation

The findings tended to support the supposition that there is no relationship between the type of job (by content) and whether or not the employer will rate larger or smaller proportions of workers as "Unsatisfactory." Apparently, the proportions of easily satisfied and less-easily satisfied supervisors occur equally among the "Communications..." jobs (e.g., shipping clerks), the "Personal Adequacy" jobs (customer and co-worker relations), and the "Skills..." jobs (the product matters most).

Table 30 illustrates the frequencies which pertain to the above interpretation.

TABLE 30

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN JOB-CONTENT EMPHASIS AND RATING AS "SATISFACTORY" OR "UNSATISFACTORY"

Entry-Job Rating	Job-Content Emphasis			
	C	Pc	Ps	S
Satisfactory	29	38	26	14
Unsatisfactory	12	12	15	3
	41	50	41	17

$X^2 = 2.818$ d.f. = 3 $.50 > p > .25$

d) Findings re rating as Satisfactory or Unsatisfactory vs. demandingness of jobs

Null hypothesis accepted; $X^2 = 4.413$ d.f. = 2
$.25 > p > .10$ (Table 31)

Interpretation

As in the case of job content, the easily satisfied or less-easily satisfied supervisor seems to appear in about equal frequency in all levels of demandingness of jobs. Some irregularity of frequencies occurred in that the supervisors of the more-demanding jobs rated fewer workers "Unsatisfactory" than would likely have happened by chance. A separate analysis of the "more-demanding" classification would probably reveal a significant relationship. A reasonable explanation might be that the "more-demanding" jobs were those where "Unsatisfactory" performance could not be tolerated as readily as it seems was the case in regard to the jobs of average and lower demandingness.

Table 31 illustrates the pattern of frequencies which pertains to the interpretation of demandingness vs. "Satisfactory"-"Unsatisfactory."

TABLE 31

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN DEMANDINGNESS OF JOB AND RATING AS "SATISFACTORY" OR "UNSATISFACTORY"

Entry-Job Rating	Demandingness of Job (less) 1	2	(more) 3
Satisfactory	31	40	36
Unsatisfactory	11	23	8
	42	63	44

$X^2 = 4.413$ d.f. = 2 $.25 > p > .10$

Relationships Between School Achievement and Programs and the Evaluations of Satisfactoriness

(III)

The findings reported in this last of three major sets of relationships tested focus most directly on the central objective of the study: exploring the relationships between school achievement measures of type of program taken and the rankings and ratings of satisfactoriness of workers by their employers.

The broad hypothesis which is examined in this set of tests is that relationships exist between (1) school achievement and programs taken, and (2) the satisfactoriness of performance on post-school jobs--as evaluated by employers. These relationships are thought to be potentially useful for prediction of success in employment, but it is not proposed that these are cause-effect relationships.[1]

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[1] The introductory section of Chapter III includes some possible explanations for why these relationships may be difficult to discern. Even where relationships are found in these tests, it is assumed that several factors are operating to make the "true" conditions unknowable except for the surface indications revealed in tests such as those reported in this volume.

Programs and satisfactoriness

In the following sequence of findings and interpretations, relationships between programs and satisfactoriness are presented first (a and b, below). Figure 6 illustrates the relationships tested which involved the programs taken.

FIGURE 6

THE RELATIONSHIP BETWEEN THE SCHOOL PROGRAM AND JOB OBTAINED AND THE EMPLOYER EVALUATION OF SATISFACTORINESS

		School Program			
		Vocationally-Oriented			General Education
		Jobs Related to Training	Jobs Not Related	Total	
Rank (score) on Content Factors	7				
	6				
	5				
	4				

Rating	S				
	U				

The broad hypothesis is represented by implied specific null hypotheses for the several pairs tested. This breakdown is indicated by the outline which follows, in which the statistical findings of the chi-square tests of significant differences are reported.

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*These scores are similar to "sten" values in that the median is 5.5 and the distribution is estimated from a normal distribution. See Table 2A, in Appendix A, for a further explanation of the scoring process.

a) Findings re school program and satisfactoriness rank

(1) General or vocationally-oriented program vs. rank on Communications Competency:

Null hypothesis accepted; $X^2 = 3.985$ d.f. = 3
$.50 > p > .25$ (Table 29A)

(2) General or vocationally-oriented program vs. rank on Personal Adequacy:

Null hypothesis accepted; $X^2 = 2.179$ d.f. = 3
$.75 > p > .50$ (Table 30A)

(3) General or vocationally-oriented program vs. rank on Skills Unique to the Job:

Null hypothesis accepted; $X^2 = 0.107$ d.f. = 3
$.995 > p > .99$ (Table 32)

(4) General or vocationally-oriented program vs. rank on Overall Satisfactoriness:

Null hypothesis accepted; $X^2 = 3.981$ d.f. = 3
$.50 > p > .25$ (Table 32A)

(5) Vocationally-oriented graduates classified by relatedness of job to training received vs. rank on Skills Unique to the Job:

Null hypothesis accepted; $X^2 = 0.978$ d.f. = 3
$.90 > p > .75$ (Table 33A)

(6) Vocationally-oriented graduates classified by relatedness of job to training received vs. rank on Overall Satisfactoriness:

Null hypothesis accepted; $X^2 = 1.969$ d.f. = 3
$.75 > p > .50$ (Table 34A)

Interpretation

None of the above tests of relationships resulted in probability values at the level of significance. These findings provide no support for a contention that either the general or the vocationally-oriented graduates ranked higher among their co-workers in the jobs that they happened to obtain. This of course does not mean that the result would be the same if the two groups exchanged jobs.

Test (3) may be worthy of special note because of the almost complete absence of irregularity between observed and expected frequencies and also because it focused on the "Skills..." factor, which might be offered as the factor most likely to have produced a difference. Interpretation must take into account the small number of jobs where "Skills..." ranked highest in importance, and also the concept in the preceding paragraph.

Tests (5) and (6) focus on another dimension--that of the vocationally-oriented graduates who did or did not obtain jobs related to the training received in school. It has been determined that the latter group clearly tended to have less-demanding jobs; therefore, it is not unexpected that the employer's evaluations of the latter, on the average, were not significantly different than the evaluations of the job-related group.

Table 32 illustrates test (3), as an example of the pattern of frequencies observed in tests of school program vs. satisfactoriness.

TABLE 32

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM EMPHASIZED AND RANK ON "SKILLS UNIQUE TO THE JOB"

Rank (score) on "Skills Unique to the Job"	School Program	
	Vocationally-Oriented	General
7	24	8
6	29	9
5	30	11
4	29	10
	112	38

$X^2 = 0.107$ d.f. = 3 $.995 > p > .99$

b) Findings re school program and rating on Satisfactory or Unsatisfactory

(1) General or vocationally-oriented program vs. Satisfactory or Unsatisfactory:

Rejection of the null hypothesis remains in doubt;
$X^2 = 2.943$ d.f. = 1
$.10 > p > .05$ (Table 33)

(2) Vocationally-oriented graduates classified by relatedness of job to training received vs. Satisfactory or Unsatisfactory:

Null hypothesis accepted; $X^2 = 0.0003$ d.f. = 1
$p < .90$ (Table 36A)

Interpretation

The relationship between the proportion of "Unsatisfactory" workers and the school program taken was not great enough to be termed significant, but the irregularity between observed and expected frequencies favored the vocationally-oriented group. This observation may provide some clues for further study, especially when appraised in connection with test (4) under a), in regard to school program vs. rank on "Overall Satisfactoriness."

It appears that a supposition which may be worth pursuing is that a significantly greater proportion of boys without vocationally-oriented training are rated "Unsatisfactory" because there may be a certain group of graduates in a typical graduating class who are unsuited (through immaturity) to succeed in any full time job, and these boys, who are not "work-oriented," are not likely to have taken a sequence in a vocational field.

Test (2), under b), reinforces the interpretation of findings pertaining to tests (5) and (b), under a), in the preceding section. Apparently, approximately the same proportions of workers in the clusters of co-workers were considered to be "Unsatisfactory" regardless of the relationship of the job to the training received in school.

Table 33 illustrates the frequencies which resulted in the dubious relationship between the school program and the rating as "Satisfactory" or "Unsatisfactory."

TABLE 33

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM EMPHASIZED AND RATING AS "SATISFACTORY" OR "UNSATISFACTORY"

Entry-Job Rating	School Program	
	Vocationally-oriented	General
Satisfactory	85	22
Unsatisfactory	27	15
	112	37

$X^2 = 2.943$ d.f. = 1 $.10 > p > .05$

Achievement and satisfactoriness

This final sub-section of the series reports the findings and interpretations on relationships between the school achievement measures and satisfactoriness (c and d in the outline). Figure 7 illustrates the elements which are tested.

FIGURE 7

THE RELATIONSHIP BETWEEN THE SCHOOL ACHIEVEMENT INDICATORS AND THE EMPLOYER EVALUATION OF SATISFACTORINESS

		Indications of Achievement			
		Class Rank	English Ave.	Voc-Or. Ave.	Attendance
Rank (score) on Content Factors	7				
	6				
	5				
	4				
Rating	S				
	U				

The first part of sub-section c) consists of the tests which pertain directly to the major hypothesis of the study, which was that ranked satisfactoriness in groupings of school subjects (letter grade averages) would tend to predict ranked satisfactoriness in clusters of comparable co-workers in entry-jobs. (Attendance record was added as a form of "achievement.")

c) Findings re school achievement and satisfactoriness rankings

(1) Class rank
vs. rank on Communications Competency:

Null hypothesis accepted; $X^2 = 9.024$ d.f. = 15
$.90 > p > .75$ (Table 37A)

(2) Class rank
vs. rank on Personal Adequacy:

Null hypothesis accepted; $X^2 = 9.883$ d.f. = 15
$.90 > p > .75$ (Table 35A)

(3) Class rank
vs. rank on Skills Unique to the Job:

Null hypothesis accepted; $X^2 = 10.351$ d.f. = 15
$.90 > p > .75$ (Table 39A)

(4) Class rank
vs. rank on Overall Satisfactoriness:

Null hypothesis accepted; $X^2 = 9.852$ d.f. = 15
$.90 > p > .75$ (Table 34)

(5) Grade average in required English courses
vs. rank on Communications Competency:

Null hypothesis accepted; $X^2 = 9.650$ d.f. = 15
$.90 > p > .75$ (Table 35)

(6) Grade average in required English courses
vs. rank on Personal Adequacy:

Null hypothesis accepted; $X^2 = 13.118$ d.f. = 15
$.75 > p > .50$ (Table 42A)

(7) Grade average in required English courses
vs. rank on Skills Unique to the Job:

Null hypothesis accepted; $X^2 = 17.796$ d.f. = 15
$.50 > p > .25$ (Table 43A)

(8) Grade average in required English courses
vs. rank on Overall Satisfactoriness:

Null hypothesis accepted; $X^2 = 14.292$ d.f. = 15
$.75 > p > .50$ (Table 44A)

(9) Grade average in vocationally-oriented courses
vs. rank on Communications Competency:

Null hypothesis accepted; $X^2 = 14.548$ d.f. = 15
$.50 > p > .25$ (Table 45A)

(10) Grade average in vocationally-oriented courses
vs. rank on Personal Adequacy:

Null hypothesis accepted; $X^2 = 11.995$ d.f. = 15
$.75 > p > .50$ (Table 46A)

(11) Grade average in vocationally-oriented courses
vs. rank on Skills Unique to the Job:

Null hypothesis rejected; $X^2 = 26.112$ d.f. = 15
$.05 > p > .02$ (Table 36)

(12) Grade average in vocationally-oriented courses
vs. rank on Overall Satisfactoriness:

Null hypothesis accepted; $X^2 = 18.964$ d.f. = 15
$.25 > p > .10$ (Table 48A)

(13) Attendance record
vs. rank on Communications Competency:

Null hypothesis rejected; $X^2 = 29.443$ d.f. = 15
$.02 > p > .01$ (Table 49A)

(14) Attendance record
vs. rank on Personal Adequacy:

Null hypothesis rejected; $X^2 = 25.472$ d.f. = 15
$.05 > p > .02$ (Table 37)

(15) Attendance record
vs. rank on Skills Unique to the Job:

Rejection of null hypothesis remains in doubt;
$X^2 = 23.543$ d.f. = 15
$.10 > p > .05$ (Table 51A)

(16) Attendance record
vs. rank on Overall Satisfactoriness

Null hypothesis rejected; $X^2 = 29.705$ d.f. = 15
$.02 > p > .01$ (Table 38)

Interpretation

The findings pertaining to class rank and English provide no support for the hypothesis that ranked satisfactoriness on-the-job might be predicted by school achievement measures in a manner parallel to predicting college success (also a form of "ranked satisfactoriness") from high school class rank. The consistency of the probability values associated with the chi-square statistics lends support to a supposition that no relationship, or a very weak relationship at best, exists.

The above statement applies to tests numbered (1) through (8), in c), above. Certain qualifications might be noted:

a) Some of the tests had less meaning because the job descriptions with "Communications..." and "Skills..." valued most were fewer in number. That is, the rank on the content factors which were valued second and third in importance by the employer tended to be reflections of the first factor, as "halo effect." Thereby, they were also reflected in the "Overall Satisfactoriness" rank. Tests (1), (3), and (7), pertaining to the class rank and English categories, fall into this classification.

b) Tests (4) and (5) were internally the most logically-related among those pertaining to class rank and English. (4) was important because it in itself was a direct test of the major hypothesis of the study. Test (5) was important because almost one-third of the jobs emphasized "Communications...," and here was shown no apparent connection between what English teachers rewarded and what employers had in mind when they were asked to rank workers on "Communications Competency."

Tables 34 and 35 illustrate the observed frequencies used in tests (4) and (5), above, respectively.

TABLE 34

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "OVERALL SATISFACTORINESS" AND HIGH SCHOOL CLASS RANK

Class Rank (in "stens")	Rank (score) on "Overall Satisfactoriness"			
	4	5	6	7
8	4	5	8	5
7	8	5	9	2
6	8	7	5	8
5	12	7	9	3
4	7	5	6	2
3	7	6	7	5
	46	35	44	25

$X^2 = 9.853$ d.f. = 15 $.90 > p > .75$

TABLE 35

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "COMMUNICATIONS COMPETENCY" AND HIGH SCHOOL GRADE AVERAGE IN ENGLISH COURSES

English Average (in "stens")	Rank (score) on "Communications Competency"			
	4	5	6	7
8	7	4	10	7
7	5	7	5	4
6	8	7	7	4
5	8	9	10	4
4	10	9	5	3
3	4	5	7	1
	42	41	44	23

$X^2 = 9.650$ d.f. = 15 $.90 > p > .75$

The findings pertaining to prediction of employment satisfactoriness through grade averages in vocationally-oriented courses presented a mixed picture. The findings pertaining to prediction from the attendance record presented a consistent pattern of relationships. Test (11) and tests (13) through (16) provide some support for the major hypothesis that school background can be used to predict ranked satisfactoriness in employment.

Certain interpretations may be appropriate in regard to tests (9) through (16):

a) Tests (9), (13), and (15) were probably influenced by "halo effect" more than they evidenced in dependent relationships, because the numbers of jobs where "Communications..." or "Skills..." were valued most were smaller.

b) Tests (11) and (14) represented the most logically-related pairs of variables pertaining to grades in vocationally-oriented courses and the attendance record. Test (11) was the one indication that a grade average may be found to predict ranked satisfactoriness, through the procedures followed in this study. Test (14) was important because attendance or absenteeism on the job was a prominent part of the definition of "Personal Adequacy."

Table 36 illustrates the observed frequencies associated with test (11), in which a significant relationship was found between grade average in vocationally-oriented courses and the rank on "Skills...," which favored the higher achievers.

TABLE 36

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "SKILLS UNIQUE TO THE JOB" AND HIGH SCHOOL GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES

Voc-Oriented	Rank (score) on "Skills Unique to the Job"			
Average (in "stens")	4	5	6	7
8	5	5	4	4
7	6	1	6	5
6	1	11	7	5
5	6	5	5	4
4	3	7	7	3
3	10	2	1	3
	31	31	30	24

$X^2 = 26.112$ d.f. = 15 $.05 > p > .02$

Table 37 illustrates the frequencies associated with test (14), in which a significant relationship was found between school attendance record and rank on "Personal Adequacy," which favored those with average and better attendance records compared with those who had a combined absence and/or tardy record of 55 to 100+ times in grades 10-12.

TABLE 37

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "PERSONAL ADEQUACY" AND HIGH SCHOOL ATTENDANCE RECORD

Attendance Record (in "stens")	Rank (score) on "Personal Adequacy"			
	4	5	6	7
8	6	2	14	2
7	10	1	3	5
6	88	44	11	8
5	5	6	11	5
44	6	7	7	44
3	13	22	7	3
	48	22	53	27

$X^2 = 25.472$ d.f. = 15 $.05 > p > .02$

Certain final observations may be appropriate in regard to tests (1) through (16) under c):

a) Tests (2), (6), (10), and (14) involved the Personal Adequacy factor. It is of interest to note that the probability values of each of these and the value for Overall Satisfactoriness which follows each one are in every case very close. The three measures of letter grade achievement showed no relationship in this context.

b) Tests (8), (12), and (16) involved the three special achievement measures compared to Overall Satisfactoriness. Grades in English and vocationally-oriented courses showed no significant relationships with satisfactoriness ranks, which is consistent with the finding for class rank.

c) Attendance is the one "achievement" measure which had significant or near-significant relationships with all four satisfactoriness ranks. Again, it should be noted that the relationship seems to be caused by the irregularities in observed frequencies involving those with the poorest attendance records and those with the lowest satisfactoriness rankings. Little difference is apparent between those who are average and good in school attendance.

d) Findings re school achievement and Satisfactory or Unsatisfactory

(1) Class rank vs. Satisfactory or Unsatisfactory:

Null hypothesis accepted; $X^2 = 3.591$ d.f. = 5
$.75 > p > .50$ (Table 53A)

(2) Grade average in required English courses vs. Satisfactory or Unsatisfactory:

Null hypothesis accepted; $X^2 = 4.078$ d.f. = 5
$.75 > p > .50$ (Table 54A)

(3) Grade average in vocationally-oriented courses vs. Satisfactory or Unsatisfactory:

Null hypothesis accepted; $X^2 = 8.015$ d.f. = 5
$.25 > p > .10$ (Table 55A)

(4) Attendance record vs. Satisfactory or Unsatisfactory:

Rejection of null hypothesis remains in doubt;
$X^2 = 9.897$ d.f. = 5
$.10 > p > .05$ (Table 39)

Interpretation

The "Satisfactory"-"Unsatisfactory" rating was considered to be somewhat closer to being an "absolute" base of evaluation than were the satisfactoriness rankings. However, they were assumed to have this quality only within each co-worker cluster evaluated, in that standards of who is considered "satisfactory" vary among employers. Any difference in standards according to employers associated with the tested groups does not show up in these findings--if a difference does in fact exist. Tests (1) and (2) above were consistent with the relationships of class rank and English to ranked satisfactoriness, in that the ratings of "Satisfactory"-"Unsatisfactory" also show no significant relationship. Tests (3) and (4) were also consistent with the tests pertaining to ranks in section c), with the irregularities showing the same tendencies but in less-significant degree.

It is of interest to speculate on an explanation for the "softening" of the forces which may have caused the significant relationships reported in section c) to appear in "weakened" form in section d). The irregularities which caused "near-significance" to occur in tests (3) and (4), in d), above, should not properly be mentioned except that all four tests, (1) through (4), were consistent with the pattern of 16 tests in section c), in that they follow the same order of probability values except that a "regression to the mean," of sorts, appeared to function.

It is possible that the factor of "how hard the boss is to please" was randomly distributed among all the jobs, and that this operated to "weaken" the findings in section c), where the rankings were not influenced by this factor, which then appear in section d) in consistent but "weaker" form.

Tables 38 and 39 illustrate the "weakening," comparing "Overall Satisfactoriness" vs. attendance with "Satisfactory"-"Unsatisfactory" vs. attendance.

TABLE 38

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "OVERALL SATISFACTORINESS" AND HIGH SCHOOL ATTENDANCE RECORD

Attendance Record (in "stens")	Rank (score) on "Overall Satisfactoriness"			
	4	5	6	7
8	4	7	12	1
7	9	2	3	5
6	9	4	9	9
5	4	10	10	3
4	7	7	7	3
3	13	5	3	4
	46	35	44	25

$X^2 = 29.705$ d.f. = 15 $.02 > p > .01$

TABLE 39

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RATING AS "SATISFACTORY" OR "UNSATISFACTORY" AND HIGH SCHOOL ATTENDANCE RECORD

Attendance Record (in "stens")	Rating	
	Satisfactory	Unsatisfactory
8	20	3
7	12	7
6	23	8
5	23	4
4	15	9
3	14	11
	107	42

$X^2 = 9.897$ d.f. = 5 $.10 > p > .05$

Testing for Differences Between Recruitment and Selection Procedures, and Between Co-Workers and Principal Subjects

Comparing recruitment and selection procedures

Results of the interviews with the 150 principal subjects made it apparent that some had been recruited and selected more carefully than others. Those who were recruited through some employment office and had been required to take tests and be recommended by their school, plus those who had to have completed a certain vocational program, were assigned to a "carefully selected" group. Those who were employed on the basis of an interview only, after "walking in," were assigned to a "carelessly selected" group.

The broad null hypothesis was that there were no significant differences between the carefully and carelessly selected groups when tested against a variety of potentially meaningful variables.

The tests conducted, with findings, are presented as follows:

(1) Carefully or carelessly selected
vs. position of person who does the hiring:

Null hypothesis rejected; $X^2 = 7.387$ d.f. = 2
$.05 > p > .02$ (Table 40)

(2) Carefully or carelessly selected
vs. school attended:

Null hypothesis accepted; $X^2 = 1.701$ d.f. = 2
$.50 > p > .25$ (Table 58A)

(3) Carefully or carelessly selected
vs. general or vocationally-oriented program:

Null hypothesis accepted; $X^2 = 0.022$ d.f. = 1
$.90 > p > .75$ (Table 59A)

(4) Carefully or carelessly selected
vs. grade average in required English courses:

Null hypothesis accepted; $X^2 = 3.489$ d.f. = 5
$.75 > p > .50$ (Table 60A)

(5) Carefully or carelessly selected
vs. grade average in vocationally-oriented courses:

Rejection of null hypothesis remains in doubt;
$X^2 = 9.830$ d.f. = 5
$.10 > p > .05$ (Table 41)

(6) Carefully or carelessly selected
vs. high school attendance record:

Null hypothesis accepted; $X^2 = 4.264$ d.f. = 5
$.75 > p > .50$ (Table 62A)

(7) Carefully or carelessly selected
vs. rank on "Overall Satisfactoriness":

Null hypothesis accepted; $X^2 = 0.777$ d.f. = 3
$.90 > p > .75$ (Table 63A)

(8) Carefully or carelessly selected
vs. rating as "Satisfactory" or "Unsatisfactory":

Null hypothesis accepted; $X^2 = 0.001$ d.f. = 1
$p < .90$ (Table 64A)

(9) Carefully or carelessly selected
vs. job content priority sequence:

Null hypothesis accepted; $X^2 = 3.676$ d.f. = 3
$.50 > p > .25$ (Table 65A)

(10) Carefully or carelessly selected
vs. demandingness of jobs:

Null hypothesis rejected; $X^2 = 6.119$ d.f. = 2
$.05 > p > .02$ (Table 42)

(11) Carefully or carelessly selected
vs. jobs classified into ten categories:

Null hypothesis rejected; $X^2 = 17.043$ d.f. = 9
$.05 > p > .02$ (Table 43)

Interpretation

Tests 1-11 lend support to the hypothesis that "carefully selected" workers differ significantly in some respects from "carelessly selected" workers. Test (1) indicates that when someone employed by the owner in a mangerial position did the hiring, the applicant was likely to have been "carefully selected." But when the owner did the hiring, 18 out of 26 workers were "walk ins" who were hired with an interview only. (Table 40)

Test (2) shows no significant differences between schools on selection procedure by employers. Test (3) indicates that as high a proportion of general graduates were employed through either "careful" or "careless" procedures as were the vocationally-oriented graduates.

Tests (4), (5), and (6) indicate that only the grade average in vocationally-oriented courses was positively related to the more "careful" selection procedures. Table 41 illustrates that only the "A" students were almost always in the "carefully selected" classification; little difference was apparent among the "B", "C", and "D" students. English grades and attendance records, on the other hand, did not seem to have any relationship to the selection procedure.

Tests (7) and (8) produced results which are consistent with findings reported earlier. It is logical that no significant relationships would be found because all ranks and ratings pertain to self-contained groups and a low evaluation would be expected just as readily from a supervisor with "careful" standards of hiring (he will tend to be less easily satisfied) than from a "careless" employer.

Test (9) shows that there are no significant differences among jobs where "communications competency," "personal adequacy," or "skills unique to the job" might be valued most--on the factor of selection procedures. Test (10), however, provides a clear indication, as illustrated by Table 42, that the more-demanding jobs are filled through the "careful" selection procedures and the less-demanding jobs are filled through the "careless" procedures.

Test (11) presents a more detailed view of the relationships which were portrayed in Test (9). The skilled jobs were filled through the "careful" procedures and some of the least skilled jobs, such as machine operators, food handlers, and physical laborers, were filled through the "careless" procedures. (Table 42)

TABLE 40

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND POSITION OF PERSON WHO DOES THE HIRING

Position of Person Who Does Hiring	Selection Procedures Careful	Selection Procedures Careless
Personnel Director	21	15
Owner	8	18
Someone with Divided Duties	19	10
	48	43

$X^2 = 7.387$ d.f. = 2 $.05 > p > .02$

TABLE 41

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES

Voc-Oriented Grades (in "stens")	Selection Procedure	
	Careful	Careless
8	13	2
7	2	4
6	7	9
5	4	5
4	6	8
3	3	5
	35	33

$X^2 = 9.830$ d.f. = 5 $.10 > p > .05$

TABLE 42

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND DEMANDINGNESS OF JOBS

Demandingness of Job	Selection Procedure	
	Careful	Careless
3 (more)	18	8
2	20	17
1 (less)	10	18
	48	43

$X^2 = 6.119$ d.f. = 2 $.05 > p > .02$

TABLE 43

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND JOBS CLASSIFIED INTO TEN CATEGORIES

Job Categories	Selection Procedure	
	Careful	Careless
Skilled white collar	7	1
Skilled blue collar	5	1
Sales clerk or attendant	3	3
Stock or shipping clerk	14	12
Driving, delivery	2	3
Machine operator	2	5
Assembly, fabrication	5	4
Janitorial	7	2
Food service, public accommodation	1	6
Miscellaneous physical labor	2	6
	48	43

$X^2 = 17.043$ d.f. = 9 $.05 > p > .02$

Comparing Co-Workers and Principal Subjects

This final section of findings and interpretations represents a large amount of time and effort in proportion to the results obtained. In order to get the data on 90 co-workers of the 150 principal subjects the following procedures were employed:

a) Results of interviews with the 123 employers were screened, with all names of co-workers listed. Graduating lists from 1962, 1963 and 1964 from more than 30 high schools were read to identify names.

b) Ninty of more than 500 co-workers were identified as those who were within a year in age of the principal subjects and who were graduates of Minneapolis-area high schools. Fourteen high schools were visited to collect the data from school records. Superintendents and principals were contacted by letter beforehand.

c) Chi-square tests of significant differences were computed to compare the co-workers with the principal subjects on I.Q., attendance, the five DAT scales, the rank on "Overall Satisfactoriness," and the rating as "Satisfactory" or "Unsatisfactory."

Purpose of comparing co-workers. The intent of the procedure summarized above was to strengthen or weaken the assumption that the groups of principal subjects from the three schools were representative of groups which might be selected in a similar way from most high schools in the metropolitan area. If it could have been shown conclusively that workers from a variety of schools, as a combined group, had aptitude characteristics not significantly different from the principal subjects, the conclusions of the study might have wider implications. Another purpose of the follow-up study was to help determine whether or not a bias had been introduced in the evaluation procedure.

Summary of results. The findings of this comparison with co-workers are of considerable interest, but probably are not worth the effort expended. The chief difficulty was that a distinct bias was introduced, not in the evaluation procedure itself, but in the selection of co-workers by the employers. Apparently, employers did not hesitate to evaluate principal subjects who were "Unsatisfactory," after the investigator had introduced the name into the list to be evaluated, but, when the employers had the responsibility of adding names of present and past co-workers, they seemingly were inclined to name the better workers and to omit the poorest ones. This is evidenced by the inclusion of only four "Unsatisfactory" workers in the co-worker group of 90, while 42 "Unsatisfactory" principal subjects were included in the group of 150.

Findings

The broad null hypothesis tested was that there were no significant differences between principal subjects and co-workers in intelligence, attendance record, the DAT scales, and in ranks and ratings of satisfactoriness. The specific findings were:

(1) Co-workers and principal subjects
vs. Intelligence Quotient:

Null hypothesis rejected; $X^2 = 13.692$ d.f. = 5
$.02 > p > .01$ (Table 46)

(2) Co-workers and principal subjects vs. attendance record:

Null hypothesis accepted; $X^2 = 7.408$ d.f. = 5
$.25 > p > .10$ (Table 69A)

(3) Co-workers and principal subjects vs. DAT verbal scale:

Null hypothesis accepted; $X^2 = 3.669$ d.f. = 5
$.75 > p > .50$ (Table 70A)

(4) Co-workers and principal subjects vs. DAT numerical scale:

Rejection of null hypothesis remains in doubt;
$X^2 = 10.414$ d.f. = 5
$.10 > p > .05$ (Table 71A)

(5) Co-workers and principal subjects vs. DAT abstract scale:

Null hypothesis accepted; $X^2 = 8.998$ d.f. = 5
$.25 > p > .10$ (Table 72A)

(6) Co-workers and principal subjects vs. DAT space scale:

Rejection of null hypothesis remains in doubt;
$X^2 = 10.083$ d.f. = 5
$.10 > p > .05$ (Table 73A)

(7) Co-workers and principal subjects vs. DAT mechanical scale:

Null hypothesis accepted; $X^2 = 4.842$ d.f. = 5
$.75 > p > .25$ (Table 74A)

(8) Co-workers and principal subjects vs. rank on "Overall Satisfactoriness":

Null hypothesis rejected; $X^2 = 13.811$ d.f. = 5
$.025 > p > .01$ (Table 45)

(9) Co-workers and principal subjects
vs. rating as "Satisfactory" or "Unsatisfactory":

Null hypothesis rejected; $X^2 = 18.896$ d.f. = 1
$p < .001$ (Table 44)

Interpretation

Test (9) confirms the illustration in Table 44--that the employers did not list names of "Unsatisfactory" co-workers, and therefore the bias is pre-determined to affect the other tests. Test (8) is a confirmation of Test (9), and Table 46 indicates that the difference exists chiefly between workers with the lower ranks.

Test (1) reflects largely the cluster of high I.Q. scores at the top of the co-worker distribution, with a sharp drop in numbers immediately below the top level. This could be a chance happening which would never be repeated in replications of the study. Table 45 illustrates the observed frequencies.

TABLE 44

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND RATING AS "SATISFACTORY" OR "UNSATISFACTORY"

Job Success Rating	Co-Workers	Principal Subjects
Satisfactory	81	107
Unsatisfactory	4	42
	85	149

$X^2 = 18.896$ d.f. = 1 $p < .001$

TABLE 45

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND RANK ON "OVERALL SATISFACTORINESS"

Rank (score) in work group	Co-Worker	Principal Subjects
8	5	2
7	19	23
6	34	44
5	16	35
4	10	41
3	2	5
	86	150

$X^2 = 13.811$ d.f. = 5 $.02 > p > .01$"

TABLE 46

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND INTELLIGENCE QUOTIENT

I.Q. (in "stens")	Co-Workers	Principal Subjects
8	33	24
7	9	20
6	9	28
5	13	27
4	11	21
3	14	21
	89	141

$X^2 = 13.692$ d.f. = 5 $.02 > p > .01$

Test (2) indicates that attendance is probably not a related factor in this context, even though it evidenced more pronounced relationships in other contexts than did any other factor.

Tests (3) through (5) are probably reflections of the I.Q. pattern, in some measure. The verbal, numerical, and abstract scales produced a cluster at the top of the co-worker scores, although the probability values did not indicate the same likelihood of significance. Test (6) remains in doubt, and Test (7) shows no relationship.

Because of the bias shown by employers in naming co-workers, it can be speculated that this bias accounts for the deviations from non-significance of relationships. Thus it is possible to reason that the schools from which principal subjects were drawn are fairly representative of most schools in the area, even though the demonstration of this point was disappointingly inconsistent.

Combined Interpretations of Findings

The values which might be derived from an appraisal of findings of this study could more likely be acquired from the detailed interpretations and accompanying tables than from summaries of findings. This observation is based on the nature of pilot studies plus the selected nature of the subjects of this study. No actual conclusions can properly be made from the findings, and the insights which may properly be acquired are restricted to groups of subjects selected by similar criteria and not to entire graduating classes.

Allowing for the above conditions, the questions and answers which follow are offered to assist in synthesizing the contents of Chapter IV.

a) Were the selected subjects alike from school to school?

The following tautological statement represents a procedure which was executed in the study reported in this volume: When selective criteria are devised to exclude high school graduates of types who tend to make entire graduating classes different from one another, those who meet the criteria will form distributions by schools which are not significantly different from school to school. The result of this procedure was that three similar school-groups were formed, based on data gathered from three senior high schools which were dissimilar in many ways. Similarity of selected groups was demonstrated on measures of intelligence, attendance, and four out of five scales of the Differential Aptitude Tests. (The foregoing was reported in Chapter III.) It was also determined that the vocationally-oriented graduates from the three schools did not differ significantly in regard to obtaining jobs related to their school training.

b) Were the general and vocationally-oriented graduates alike?

Because the similarity of the school groups had been demonstrated, at least in large measure, it became possible to equate the proportions from the groups at defined levels of scholastic achievement. This in turn made it possible to discover whether or not the achievement of the general education graduates of combined school-groups was significantly different from the achievement of the vocationally-oriented graduates. It was found that these groups did not differ significantly in class rank or English achievement, and no difference in school attendance record was found.

c) What kinds of jobs were studied?

Testing the two dimensions of the job definition resulted in a clearly significant relationship. The more-demanding jobs tended to be the jobs associated with employers stating that they valued "Communications Competency" or "Skills Unique to the Job" most. The least-demanding jobs tended to be those in which "Personal Adequacy" was valued most, with "Skills Unique to the Job" ranked second. Of the 150 jobs, 91 had "Personal Adequacy" ranked first, 42 had "Communications Competency" valued most by employers, and only 17 had "Skills Unique to the Job" ranked highest.

d) Did "Unsatisfactory" workers lose their jobs?

Almost one-third of the subjects were rated "Unsatisfactory" by their employers, despite the fact that all had been employed more than 90 days at the time the evaluation was made. Apparently, a considerable portion of those who were "Unsatisfactory" were not dismissed. The test of the relationship between the rating of "Satisfactory"-"Unsatisfactory" and the rank on "Overall Satisfactoriness" was predetermined to be close, but the specific frequencies were of some interest. The table associated with this relationship registered the proportions of subjects who were ranked lowest but were still "Satisfactory," plus those who were "Unsatisfactory" but still not lowest in rank.

e) Which boys got which jobs?

In testing relationships between the school experience factors and the definitions of jobs obtained, no significant relationships were found between achievement or attendance and the job-content emphases (except that some clues for larger studies may have been provided). On the demandingness of jobs obtained, however, the relationship was significant for class rank, English, and vocationally-oriented courses, with the higher achievers tending to have the more-demanding jobs. No relationship was found between school attendance and demandingness of jobs.

f) Who got jobs related to training received?

When those among the vocationally-oriented who had jobs which were related to the training received were compared to those whose jobs were not related to training, differences were indicated, in respect to the grade average in vocationally-oriented courses, favoring those who had the jobs related to training. This relationship was reflected in class rank to the extent that vocationally-oriented courses were a part of class rank. But, the achievement level in English and the attendance record seemed to have no relationships to graduates obtaining jobs which were related to the vocationally-oriented high school training they had received.

g) Are bosses in certain kinds of jobs harder to please?

Tests were conducted to try to ascertain relationships between the job definitions and the evaluations of satisfactoriness which the employers had made on clusters of graduates. No significant relationships were found in any of the tests. This outcome tends to support a supposition that employers tend to rank about the same proportions of workers "Satisfactory" and "Unsatisfactory," regardless of the type or demandingness of the job. Therefore, no case can be made for a supposition that vocationally-oriented training, for example, tends to help many boys obtain (or keep) jobs which are too demanding for them.* (Instead, the small proportion of jobs where "Skills Unique to the Job" was ranked as most important helps to make a case for paying greater attention to school objectives related to "Personal Adequacy," even in vocationally-oriented courses, and especially for students who will get these jobs--usually the lowest achievers.)

h) Do the bosses like vocationally-oriented graduates best?

No significant relationships were found between the school programs emphasized and either the ranks or ratings of satisfactoriness. One test which resulted in a probability associated with the chi-square statistic between .05 and .10, on "Satisfactory"-"Unsatisfactory," was in the direction of favoring the vocationally-oriented group. In regard to the job definition, no relationships were found between the classification by school program emphasized and either the job-content or demandingness dimensions.

i) What differences do the hiring procedures make?

When the 48 "carefully selected" workers were compared to the 43 "carelessly selected" workers, some differences were noted. First, the "careless" hiring tended to be done by the owners themselves, while the "careful" hiring was usually done by employed managerial personnel. "Careful" selection was recorded as often for general graduates as for vocationally-oriented graduates, and as often for one school as for the others. "A" students in vocational courses tended to be "carefully selected," as they also tended to have the best jobs, but English grades and attendance record seemed to make no difference--in the "careful-careless" context.

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*No objective record was made of the number of boys who were vocationally-trained, who then obtained a job related to their training with a high demandingness rating, and then were fired before 90 days. A few such cases were noted.

j) Can satisfactoriness be predicted by academic grades?

The central set of tests in the study probed for relationships between the measures of school achievement and the ratings and rankings of satisfactoriness by employers. By these means the hypothesis was tested which proposed that satisfactoriness in employment might be predicted by certain school experience factors in much the same way that achievement in college ("ranked satisfactoriness" of another sort) can be predicted by high school class rank. The findings pertaining to class rank and English achievement did not support the hypothesis, in that the probability values associated with the chi-square statistics did not approach the significant level. Several alternative explanations of this outcome might include lack of competitive spread in co-worker clusters, lack of true similarity of performance qualities evaluated, and a number of others (discussed elsewhere in this volume.)

k) What does seem to predict success?

The hypothesis that satisfactoriness would be predicted by school achievement was partially supported by findings pertaining to grade averages in vocationally-oriented courses and the attendance record. (Attendance was considered to be an indicator of achievement, in this context.) The breakdown of frequencies illustrated that the significant findings in the case of the grade average in vocationally-oriented courses vs. the rank on "Skills Unique to the Job," was almost entirely the result of observations on a number of subjects who had both the lowest school achievement in vocationally-oriented courses and also the lowest rank on "Skills Unique to the Job." The specific frequencies associated with tests involving attendance reveal similar concentrations of subjects where poorest attendance was associated with lowest ranks and ratings by employers. Subjects with the lowest score for attendance were absent and/or tardy 55 to 100+ times in three years; therefore, a reasonable assumption is that chronic truancy is associated with other characteristics which caused these individuals both to have low achievement in vocationally-oriented courses and to be ranked low by employers.

CHAPTER V

CONCLUDING STATEMENT

Theoretical Observations

General observations

The study is entitled a pilot study because the outcomes are not conclusions which can be applied to whole graduating classes or even necessarily to similarly-selected graduates of any school. The methods used to define jobs were arbitrary and experimental. The contribution of the study may be to serve as a source of ideas or of hypotheses to be tested in further research.

Numerous studies over many years will be needed to make progress toward a validation of curriculum through ascertaining outcomes in post-school behavior. The job-setting is considered to be appropriate for continued research because it is common to most graduates of school programs, it has some standard features (such as required attendance and other features related to evaluating personal adequacy), and the potential for evaluation is present in the supervisor-worker relationship.

The "affective" goals of education--attitudes, interests, satisfactory human relations, and values--may be the most important but are least subject to evaluation. The environment of the job holds the best promise for fruitful research, partly because the affective domain of behavior is becoming more important on the job--both for job performance and in regard to independent ends.

Observations specifically related to the study

The research on prediction of college success indicates that high school achievement predicts but that the pattern of courses taken does not. Research on prediction of vocational success has had a more difficult time, partly because of the lack of a comparably definitive criterion. The pilot study reported in this volume suggests that prediction of poor success may be easier than the converse, perhaps because factors such as poor school attendance tend to be associated with a complex of undesirable characteristics which are reflected in low achievement as well.

The uniformity of the non-significant findings suggests that the various factors and forces which determine which boys obtain which jobs resulted in co-worker groups with relatively short ranges of characteristics which please or do not please their supervisors. If this supposition is correct, it would, together with the low reliability of ratings, explain most of the lack of significant findings. Of course an alternative explanation could be that the whole school situation is too different from the work situation to allow for valid constructs between specific school achievement and supposedly related job-performance factors. This was probably the case, especially, in the construct between English grades and "Communications Competency" on the job.

No satisfactory ultimate criterion for evaluating the outcomes of school experience exists for graduates who go directly into jobs. The same problem exists for graduates of college programs, of course, since success in professional programs is still an intermediate criterion. It is of great importance that this problem be given sufficient attention, for until adequate predictive relationships can be established between education and all forms of post-school behavior, curriculum will continue to be developed and executed on a subjective and largely individual basis.

Recommendations for Further Study

Further development of instruments

The method of defining jobs on a grid, with "demandingness" on one axis and "job content" on the other axis, may be useful if further refined. The advantages of generalizing these two components, instead of attempting to provide detailed definitions of thousands of jobs, are these:

a) Automation and rapid technological change necessitate adaptability of workers (perhaps each square on the grid can represent a "family" of jobs within which a worker could easily adapt because they are fairly equal in difficulty and emphasize the same characteristics, even though their titles and detailed descriptions might sound very different);

b) Follow-up studies show that as many as half of all trained workers do not get placed or retained in a job they were trained for (perhaps the more generalized definition, and a more generalized training, would provide for better utilization of training).

A number of other features of the study may have pilot utility, especially the method of obtaining evaluations from the employers.

New studies needed at the post-high school level

Most research currently underway pertaining to problems similar to those approached in the present study appears to be focused on the effectiveness of post-high school programs of vocational and technical education. Examples are the "Specialty Oriented Student Research Program" in progress at the State University of Iowa, and the study on "Preparation of Youth for Effective Occupational Utilization" underway at the Pennsylvania State University and Rutgers-The State University.

The research emphasis on post-high school programs may be justified because of the distinct trend toward having the bulk of youth take pre-employment schooling beyond grade 12. If most youth use opportunities for post-high school vocational training (college and junior college programs are included because they are increasingly vocational in purpose), then the evaluation of high school vocational programs may become an unresolved but largely academic problem.

The study reported in this volume was conducted on workers who had no post-high school training because if the same research format were applied to graduates of post-high school programs, at their current stage of development of most post-high school programs, the result would probably be misleading when conditions change in future years. At the time of this study the students in post-high school programs were "volunteers," while the high school group studied (after extracting those who went on to post-high school training) were "draftees" (largely reluctant students). The two types, if compared, would likely have different distributions of school characteristics and achievement, placement in related jobs, and evaluations of satisfactoriness in employment.

As soon as post-high school training is nearly as essential to obtaining satisfactory employment as high school graduation is today, the investigator believes, the students at grades 13 and 14 level will also tend to possess the characteristics of "draftees," (because the "volunteers" will then be in grades 15 and 16 and beyond), and their curricula will be subject to the inertia that large capital investments in buildings and large proportions of tenure staff tend to produce.

Needs for basic research

(1) The "criterion problem" will perhaps never be resolved, because most ultimate criteria are inter-personal, subjective, and in a state of constant change. However, there is hope that as employers become more sophisticated in supervisory methods

and more appreciative of research, enough progress can be made so that at least some gross approximations may be made which relate school experience to job performance.

(2) Much work is needed in regard to instruments and techniques for predicting outcomes of education, for until relationships between school experiences and behavior in post-school situations can be put on a cause-effect basis instead of a predictive basis only, there will be no real evidence that many elements of education do more than screen and select candidates for their eventual vocational status. The necessity of specific formal elements of curricular experience will continue to be assumed.

(3) Automation and semi-automation promise to further reduce the importance of individual performance on many jobs--at least performance in the ways which formerly were of great significance, such as technical skill, strength, endurance, or skill in person-to-person salesmanship. Nevertheless, most people will continue to spend a large part of their lives on-the-job, and will continue to need the emotional fulfillment of being important to the accomplishment of certain goals. Basic research should be conducted to further evaluate individual needs, and to study ways of fulfilling affective needs of workers (appreciations, values, etc.) in ways which may or may not be related to the production or distribution of material products.

BIBLIOGRAPHY

○ Andre, Nevin E. "Post High School Educational Experiences and Occupational Status of General-Academic and Vocational-Technical High School Graduates." (Ed.D. thesis summary, mimeographed.) Columbia: University of Missouri, 1964.

Balma, Michael J. "The Concept of Synthetic Validity," Personnel Psychology, 12:395-96; Autumn 1959.

Barr, A. S., et al. "Wisconsin Studies of the Measurement and Prediction of Teacher Effectiveness: A Summary of Investigations," Journal of Experimental Education, 30:1-156; September 1961.

Becktoldt, Harold P. "Problems of Establishing Criterion Measures," Personnel Research and Test Development in the Bureau of Naval Personnel. (Dewey B. Stuit, Ed.) Princeton: Princeton University Press, 1947.

Bell, Forest D., Hoff, Alvin L., and Hoyt, Kenneth B. "A Comparison of Three Approaches to Criterion Measurement," Journal of Applied Psychology, 47:416-418; December 1963.

Bennett, George K., Seashore, Harold G., and Wesman, Alexander G. Differential Aptitude Tests (3rd Edition). New York: Psychological Corporation, 1959.

Brandon, George L. and Evans, Rupert N. "Research in Vocational Education," Vocational Education, Sixty-fourth Yearbook of the National Society for the Study of Education, Part I. Chicago: N.S.S.E., 1965.

Brink, William G. "Secondary Education--Programs," Encyclopedia of Educational Research (ed. by C. W. Harris). Third Edition, pp. 1259-1272. New York: MacMillan Co., 1960.

Brayfield, A. H. and Crockett, W.H. "Employee Attitudes and Employee Performance," Psychological Bulletin, 52:396-424; September 1955.

Bureau of Manpower Utilization. "Entry Occupational Classification," Part IV of Dictionary of Occupational Titles. Washington: U.S. Government Printing Office, 1944.

Chamberlin, Dean, et al. Did They Succeed in College? New York: Harper and Bros., 1942.

Douglass, H. R. "Selecting College Entrants," *Journal of Higher Education*, 3:179-184; April 1932.

Fine, Sidney A. "A Structure of Worker Functions," *Personnel and Guidance Journal*, 34:66-73; October 1955.

Gagne, Robert M. "Military Training and Principles of Learning," *American Psychologist*, 17:82-91, February 1962.

Garrett, Harley F. "A Review and Interpretation of Investigations of Factors Related to Scholastic Success in Colleges of Arts and Sciences and Teachers Colleges," *Journal of Experimental Education*, 18:91-138; December 1949.

Ghiselli, Edwin E. "Dimensional Problems of Criteria," *Journal of Applied Psychology*, 40:1-4; February 1956.

Guion, Robert M. "Criterion Measurement and Personnel Judgments," *Personnel Psychology*, 14:141-149, Summer 1961.

Guisti, Joseph P. "Relationship of High School Curriculum Experiences to College Grade Point Averages," *Educational and Psychological Measurement*, 23:815-16; Winter 1963.

Hays, William L. *Statistics for Psychologists*. New York: Holt, Rinehart and Winston, 1963.

Heron, Alistair. "Satisfaction and Satisfactoriness: Complementary Aspects of Occupational Adjustment," *Occupational Psychology*, 28:740-53; July 1954.

Kearney, Nolan C. and Cook, Walter W. "Curriculum," *Encyclopedia of Educational Research* (ed. by C. W. Harris). Third Edition, pp. 358-364. New York: MacMillan, 1960.

Kipnis, David and Glickman, Albert S. "The Prediction of Job Performance," *Journal of Applied Psychology*, 46:50-56; February 1962.

Kjos, Oscar E. "Occupational Experience and Success of Day-Trade Versus General School Graduates." (Ed.D. thesis summary report) *The University of Missouri Bulletin*, 55:No. 29; August 1954.

Leighbody, Gerald B. "Trade and Industrial Education," *Encyclopedia of Educational Research* (ed. by C. W. Harris). Third Edition, pp. 1527-1528. New York: MacMillan Co., 1960.

Lloyd-Jones, Esther and Smith, Margaret R. "Higher Education Programs," *Review of Educational Research*, 33:163-170; April 1963.

Lyman, Howard B. Test Scores and What They Mean. Englewood Cliffs: Prentice-Hall, 1963.

MacDonald, James B. and Raths, James D. "Curriculum Research: Problems, Techniques, and Prospects," Review of Educational Research, 33:322-329; June 1963.

Numerical Analysis Center. UMSTAT Computer Programs Manual. Minneapolis: University of Minnesota Numerical Analysis Center, 1964.

Rosen, Howard. "Vocational Education and Manpower Needs," Occupational Outlook Quarterly, pp. 5-8. U.S. Department of Labor; December 1964.

Rothlisberger, Fritz J. and Dickson, William J. Management and the Worker. Cambridge: Harvard University Press, 1939.

Scott, Thomas B., et al. A Definition of Work Adjustment. Minneapolis: Industrial Relations Center, University of Minnesota, 1958.

Sluckin, W. "Combining Criteria of Occupational Success," Occupational Psychology, 30: Part I, pp. 20-26; January 1956. Part II, pp. 56-68; April 1956.

Super, Donald E. "The Criteria of Vocational Success," Occupations, 30:5-9; October 1951.

______________ and Crites, John O. Appraising Vocational Fitness (rev. ed.). New York: Harper and Bros., 1962.

Thomas, Lawrence G. The Occupational Structure and Education. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1956.

Travers, Robert M. W. "Significant Research on the Prediction of Academic Success," The Measurement of Student Adjustment and Achievement (ed. by Wilma T. Donahue, et al.) Ann Arbor: University of Michigan, 1949.

U.S. Department of Labor. Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization, and Training. Washington: U.S. Government Printing Office, 1963.

Walker, Helen M. and Lev, Joseph. Statistical Inference. New York: Holt, Rinehart and Winston, 1953.

Walz, Gary R. "Vocational Development Process," Review of Educational Research, 33:197-204; April 1963.

Wenrich, Ralph C. "Vocational Education," Encyclopedia of Educational Research (ed. by C.W. Harris). Third Edition, Pp. 1562-1563. New York: MacMillan Co., 1960.

Wolfbein, Seymour L. "Automation, Education, and Individual Liberty," Teachers College Record, 66:27-32; October 1964.

APPENDIX A

SUPPLEMENTARY TABLES

APPENDIX B

FORMS USED IN GATHERING DATA

FORM I: INTERVIEW BETWEEN COUNSELOR AND GRADUATE

FORM II: DATA FROM SCHOOL RECORDS

FORM III: LETTER AND INFORMATION SENT TO EMPLOYERS

FORM IV: INTERVIEW WITH EMPLOYER

Part A - Background Information plus "Demandingness"

Part B - Criteria Cards plus Name Slip for Rankings

TABLE 1A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN MECHANICAL APTITUDE SCORE (DAT) AND JOB-CONTENT EMPHASIS

Mechanical DAT (in "stens")	Job-Content Emphasis*			
	C	Pc	Ps	S
8	10	7	5	2
7	6	7	6	2
6	5	12	4	4
5	7	8	6	6
4	7	6	7	2
3	4	5	8	1
	39	45	36	17

$X^2 = 12.474$ d.f. = 15 $.75 > p > .50$

*Wherever the original classifications produced too-few expected frequencies for valid chi-square applications, classifications were grouped as necessary. (Expected frequencies are not shown in tables but were included in the computer print-out to assist the writer in making interpretations.)

In the above table, CPS and CSP jobs have been grouped as "C" jobs, and SCP and SPC jobs are grouped as "S" jobs. "Pc" is a briefer symbol for jobs where "Personal Adequacy" ranked first, with "Communications Competency" second. "Ps" differs from "Pc" in that "Skills Unique to the Job" ranked second in the "Ps" jobs.

TABLE 2A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN MECHANICAL APTITUDE SCORE (DAT) AND EMPLOYER'S RANK ON "SKILLS UNIQUE TO THE JOB"

Mechanical DAT Score (in "stens")	Rank (score)* for "Skills Unique to the Job"			
	4	5	6	7
8	3	8	6	7
7	5	3	8	5
6	9	8	3	5
5	7	8	6	6
4	6	6	7	3
3	6	4	5	3
	36	37	35	29

$X^2 = 10.269$ d.f. = 15 $.90 > p > .75$

*It should be noted that all scores assigned to the ranks designated by employers on the satisfactoriness factors are interpolated into approximations of "stens," using the intermediate step of "Table XX, Transformation of Ranks to Standard Scores," which appears in Walker and Lev, op. cit., p. 480.

First, each rank was assigned a standard score from the table. For ranks among clusters of three and four, the table was extended by graphic means to obtain estimates.

Next, to equate the midpoint of 50 to 5.5, all standard scores of 30-39 became "4", all standard scores of 40-49 became "5", all standard scores of 51-59 became "6", and all standard scores of 61-69 became "7". In clusters of 3 and 5 workers, the rank frequently fell at the standard scores of 40, 50, and 60, which are the midpoints between the one-digit values. In these cases, the rank was assigned upward or downward according to whether or not one or more of the workers in the cluster had been rated "unsatisfactory"--under the assumption that an unsatisfactory worker still working past 90 days would tend to indicate a lower standard of hiring and retaining workers. (This procedure was thought to be at least better than the alternatives of tossing a coin or placing subjects higher or lower alternately.)

TABLE 3A*
(I-a-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL CLASS RANK AND JOB-CONTENT EMPHASIS

Class Rank (in "stens")	Job-Content Emphasis			
	C	Pc	Ps	S
8	10	7	2	3
7	8	7	7	2
6	11	11	4	2
5	6	8	12	5
4	4	9	6	1
3	3	8	10	4
	42	50	41	17

$X^2 = 19.260$ d.f. = 15 $.25 > p > .10$

*Also appears in Chapter IV as Table 21.

TABLE 4A*
(I-a-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL GRADE AVERAGE IN ENGLISH AND JOB-CONTENT EMPHASIS

English Average (in "stens")	Job-Content Emphasis			
	C	Pc	Ps	S
8	11	10	3	4
7	8	5	4	4
6	5	7	10	4
5	10	11	9	1
4	6	13	6	2
3	2	4	9	2
	42	50	41	17

$X^2 = 20.892$ d.f. = 15 $.25 > p > .10$

*Also appears in Chapter IV as Table 22

TABLE 5A
(I-a-3)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES AND JOB-CONTENT EMPHASIS

Vocationally-oriented Average (in "stens")	Job-Content Emphasis C	Pc	Ps	S
8	6	4	3	5
7	4	5	6	3
6	8	8	6	2
5	5	7	5	3
4	6	7	6	1
3	3	5	6	2
	42	50	41	17

$X^2 = 8.043$ d.f. = 15 $.95 > p > .90$

TABLE 6A
(I-a-4)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN RECORD OF HIGH SCHOOL ATTENDANCE AND JOB-CONTENT EMPHASIS

Attendance Record (in "stens")	Job-Content Emphasis C	Pc	Ps	S
8	9	7	5	3
7	5	6	7	1
6	8	12	5	6
5	7	10	9	1
4	9	7	6	2
3	4	8	9	4
	42	50	41	17

$X^2 = 11.586$ d.f. = 15 $.75 > p > .50$

TABLE 7A*
(I-b-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL CLASS RANK AND DEMANDINGNESS LEVEL OF ENTRY-JOB

Class rank (in "stens")	Demandingness of Job (less) 1	2	(more) 3
8	3	5	14
7	3	12	9
6	4	16	8
5	11	14	6
4	10	7	3
3	11	9	5
	42	63	45

$X^2 = 28.556$ d.f. = 10 $p < .005$

*Also appears in Chapter IV as Table 23.

TABLE 8A*
(I-b-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL GRADE AVERAGE IN ENGLISH AND DEMANDINGNESS LEVEL OF ENTRY-JOB

English Average (in "stens")	Demandingness of Job (less) 1	2	(more) 3
8	4	9	15
7	4	6	11
6	8	9	9
5	10	16	5
4	7	15	5
3	9	8	--
	42	63	45

$X^2 = 27.577$ d.f. = 10 $p < .005$

*Also appears in Chapter IV as Table 24.

TABLE 9A
(I-b-3)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES AND DEMANDINGNESS LEVEL OF ENTRY-JOB

Vocationally-oriented Average (in "stens")	Demandingness of Job (less) 1	2	(more) 3
8	2	5	11
7	2	10	6
6	4	14	6
5	7	6	7
4	9	8	3
3	7	6	3
	31	49	36

$X^2 = 20.977$ d.f. = 10 $p < .025$

TABLE 10A
(I-b-4)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN RECORD OF HIGH SCHOOL ATTENDANCE AND DEMANDINGNESS LEVEL OF ENTRY-JOB

Attendance (in "stens")	Demandingness of Job (less) 1	2	(more) 3
8	6	12	6
7	4	11	4
6	7	12	12
5	7	12	8
4	7	7	10
3	11	9	5
	42	63	45

$X^2 = 9.265$ d.f. = 10 $.75 > p > .50$

TABLE 11A*
(I-c-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM EMPHASIZED AND JOB-CONTENT EMPHASIS

Job-Content Emphasis	Vocationally-Oriented	General Education
C	30	12
Pc	35	15
Ps	31	10
S	16	1
	112	38

$X^2 = 4.228$ d.f. = 3 $.50 > p > .25$

*Also appears in Chapter IV as Table 25.

TABLE 12A*
(I-c-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOBS TO TRAINING RECEIVED AND JOB-CONTENT EMPHASIS

	Vocationally-Oriented Graduates	
Job-Content Emphasis	Jobs Related to Training Received	Jobs Not Related to Training
C	14	16
Pc	10	25
Ps	15	16
S	13	3
	52	60

$X^2 = 12.337$ d.f. = 3 $p < .01$

*Also appears in Chapter IV as Table 26.

TABLE 13A
(I-d-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM EMPHASIZED AND DEMANDINGNESS LEVEL OF ENTRY-JOB

Demandingness Level	Vocationally-Oriented	General Education
3 (more)	35	10
2	46	17
1 (less)	31	11
	112	38

$X^2 = 0.337$ d.f. = 2 $.99 > p > .98$

TABLE 14A
(I-d-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOBS TO TRAINING RECEIVED AND DEMANDINGNESS LEVEL OF ENTRY-JOB

	Vocationally-Oriented Graduates	
Demandingness Level	Jobs Related to Training Received	Jobs Not Related to Training
3 (more)	26	9
2	18	28
1 (less)	8	23
	52	60

$X^2 = 17.205$ d.f. = 2 $p < .001$

TABLE 15A
(I-e-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOBS TO TRAINING RECEIVED AND HIGH SCHOOL CLASS RANK

	Vocationally-Oriented Graduates	
Class Rank (in "stens")	Jobs Related to Training Received	Jobs Not Related to Training
8	9	4
7	10	5
6	10	15
5	13	11
4	4	11
3	6	14
	52	60

$X^2 = 10.706$ d.f. = 5 $.10 > p > .05$

TABLE 16A
(I-e-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOBS TO TRAINING RECEIVED AND HIGH SCHOOL GRADE AVERAGE IN ENGLISH

	Vocationally-Oriented Graduates	
English Average (in "stens")	Jobs Related to Training Received	Jobs Not Related to Training
8	10	7
7	9	7
6	9	12
5	9	14
4	8	12
3	7	8
	52	60

$X^2 = 2.603$ d.f. = 5 $.90 > p > .75$

TABLE 17A*
(I-e-3)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOB TO TRAINING RECEIVED AND HIGH SCHOOL GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES

Vocationally-Oriented Average (in "stens")	Vocationally-Oriented Graduates: Jobs Related to Training Received	Vocationally-Oriented Graduates: Jobs Not Related to Training
8	11	6
7	14	4
6	8	15
5	9	10
4	6	14
3	4	11
	52	60

$X^2 = 15.181$ d.f. = 5 $p < .01$

*Also appears in Chapter IV as Table 27.

TABLE 18A
(I-e-4)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOB TO TRAINING RECEIVED AND SCHOOL ATTENDANCE RECORD

Attendance Record (in "stens")	Vocationally-Oriented Graduates: Jobs Related to Training Received	Vocationally-Oriented Graduates: Jobs Not Related to Training
8	8	11
7	6	7
6	11	13
5	11	9
4	9	9
3	7	11
	52	60

$X^2 = 1.241$ d.f. = 5 $.95 > p > .90$

TABLE 19A
(II-a-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN JOB-CONTENT EMPHASIS AND RANK ON "COMMUNICATIONS COMPETENCY"

Rank (score) on "Communications Competency"	Job-Content Emphasis			
	C	Pc	Ps	S
7	7	11	3	2
6	14	12	10	8
5	9	12	16	4
4	12	15	12	3
	42	50	41	17

$X^2 = 9.864$ d.f. = 9 $.50 > p > .25$

TABLE 20A
(II-a-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN JOB - CONTENT EMPHASIS AND RANK ON "PERSONAL ADEQUACY"

Rank (score) on "Personal Adequacy"	Job-Content Emphasis			
	C	Pc	Ps	S
7	6	10	7	4
6	15	16	15	7
5	10	5	4	3
4	11	19	15	3
	42	50	41	17

$X^2 = 7.365$ d.f. = 9 $.75 > p > .50$

TABLE 21A*
(II-a-3)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN JOB-CONTENT EMPHASIS AND RANK ON "SKILLS UNIQUE TO THE JOB"

Rank (score) on "Skills Unique to the Job"	Job-Content Emphasis			
	C	Pc	Ps	S
7	8	14	5	5
6	11	10	13	4
5	11	12	15	3
4	12	14	8	5
	42	50	41	17

$X^2 = 7.537$ d.f. = 9 $.75 > p > .50$

*Also appears in Chapter IV as Table 28.

TABLE 22A
(II-a-4)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN JOB-CONTENT EMPHASIS AND RANK ON "OVERALL SATISFACTORINESS"

Rank (score) on "Overall Satisfactoriness"	Job-Content Emphasis			
	C	Pc	Ps	S
7	2	5	7	3
6	14	11	10	6
5	17	9	13	11
4	13	10	14	5
	42	50	41	17

$X^2 = 6.531$ d.f. = 9 $.75 > p > .50$

TABLE 23A
(II-b-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN DEMANDINGNESS OF JOB AND RANK ON "COMMUNICATIONS COMPETENCY"

Rank (score) on "Communications Competency"	Demandingness of Job		
	(less) 1	2	(more) 3
7	5	9	9
6	12	16	16
5	15	17	9
4	10	21	11
	42	63	45

$X^2 = 5.015$ d.f. = 6 $.75 > p > .50$

TABLE 24A
(II-b-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN DEMANDINGNESS OF JOB AND RANK ON "PERSONAL ADEQUACY"

Rank (score) on "Personal Adequacy"	Demandingness of Job		
	(less) 1	2	(more) 3
7	9	7	11
6	18	21	14
5	4	10	8
4	11	25	12
	42	63	45

$X^2 = 7.066$ d.f. = 6 $.50 > p > .25$

TABLE 25A*
(II-b-3)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN DEMANDINGNESS OF JOB AND RANK ON "SKILLS UNIQUE TO THE JOB"

Rank (score) on "Skills Unique to the Job"	Demandingness of Job (less) 1	2	(more) 3
7	7	11	14
6	16	15	7
5	11	18	12
4	8	19	12
	42	63	45

$X^2 = 8.615$ d.f. = 6 $.25 > p > .10$

*Also appears in Chapter IV as Table 29.

TABLE 26A
(II-b-4)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN DEMANDINGNESS OF JOB AND RANK ON "OVERALL SATISFACTORINESS"

Rank (score) on "Overall Satisfactoriness"	Demandingness of Job (less) 1	2	(more) 3
7	7	6	12
6	14	17	13
5	10	17	8
4	11	23	12
	42	63	45

$X^2 = 7.148$ d.f. = 6 $.50 > p > .25$

TABLE 27A*
(II-c)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN JOB-CONTENT EMPHASIS AND RATING AS "SATISFACTORY" OR "UNSATISFACTORY"

Entry-Job Rating	Job-Content Emphasis			
	C	Pc	Ps	S
Satisfactory	29	38	26	14
Unsatisfactory	12	12	15	3
	41	50	41	17

$X^2 = 2.818$ d.f. = 3 $.50 > p > .25$

*Also appears in Chapter IV as Table 30.

TABLE 28A*
(II-d)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN DEMANDINGNESS OF JOB AND RATING AS "SATISFACTORY" OR "UNSATISFACTORY"

Entry-Job Rating	Demandingness of Job		
	(less) 1	2	(more) 3
Satisfactory	31	40	36
Unsatisfactory	11	23	8
	42	63	44

$X^2 = 4.413$ d.f. = 2 $.25 > p > .10$

*Also appears in Chapter IV as Table 31.

TABLE 29A
(III-a-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM EMPHASIZED AND RANK ON "COMMUNICATIONS COMPETENCY"

Rank (score) on "Communications Competency"	School Program	
	Vocationally-Oriented	General
7	14	9
6	36	8
5	32	9
4	30	12
	112	38

$X^2 = 3.985$ d.f. = 3 $.50 > p > .25$

TABLE 30A
(III-a-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM EMPHASIZED AND RANK ON "PERSONAL ADEQUACY"

Rank (score) on "Personal Adequacy"	School Program	
	Vocationally-Oriented	General
7	22	5
6	39	14
5	18	4
4	33	15
	112	38

$X^2 = 2.179$ d.f. = 3 $.75 > p > .50$

TABLE 31A*
(III-a-3)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM EMPHASIZED AND RANK ON "SKILLS UNIQUE TO THE JOB"

Rank (score) on "Skills Unique to the Job"	School Program	
	Vocationally-Oriented	General
7	24	8
6	29	9
5	30	11
4	29	10
	112	38

$X^2 = 0.107$ d.f. = 3 $.995 > p > .99$

*Also appears in Chapter IV as Table 32.

TABLE 32A
(III-a-4)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM EMPHASIZED AND RANK ON "OVERALL SATISFACTORINESS"

Rank (score) on "Overall Satisfactoriness"	School Program	
	Vocationally-Oriented	General
7	18	7
6	36	8
5	28	7
4	30	16
	112	38

$X^2 = 3.981$ d.f. = 3 $.50 > p > .25$

TABLE 33A
(III-a-5)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOBS TO TRAINING RECEIVED AND RANK ON "SKILLS UNIQUE TO THE JOB"

Rank (score) on "Skills Unique to the Job"	Vocationally-Oriented Graduates	
	Jobs Related to Training Received	Jobs Not Related to Training
7	12	12
6	15	14
5	12	18
4	13	16
	52	60

$X^2 = 0.978$ d.f. = 3 $.90 > p > .75$

TABLE 34A
(III-a-6)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOB TO TRAINING RECEIVED AND RANK ON "OVERALL SATISFACTORINESS"

Rank (score) on "Overall Satisfactoriness"	Vocationally-Oriented Graduates	
	Jobs Related to Training Received	Jobs Not Related to training
7	9	9
6	17	19
5	10	18
4	16	14
	52	60

$X^2 = 1.969$ d.f. = 3 $.75 > p > .50$

TABLE 35A*
(III-b-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN HIGH SCHOOL PROGRAM EMPHASIZED AND RATING AS "SATISFACTORY" OR "UNSATISFACTORY"

Entry-Job Rating	School Program	
	Vocationally-Oriented	General
Satisfactory	85	22
Unsatisfactory	27	15
	112	37

$X^2 = 2.943$ d.f. = 1 $.10 > p > .05$

*Also appears in Chapter IV as Table 33.

TABLE 36A
(III-b-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN VOCATIONALLY-ORIENTED GRADUATES CLASSIFIED BY RELATEDNESS OF JOB TO TRAINING RECEIVED AND RATING AS "SATISFACTORY" OR "UNSATISFACTORY"

Entry-Job Rating	Vocationally-Oriented Graduates	
	Jobs Related to Training Received	Jobs Not Related to Training
Satisfactory	39	46
Unsatisfactory	13	14
	52	60

$X^2 = 0.0003$ d.f. = 1 $p > .90$

TABLE 37A
(III-c-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "COMMUNICATIONS COMPETENCY" AND HIGH SCHOOL CLASS RANK

Class Rank (in "stens")	Rank (score) on "Communications Competency"			
	4	5	6	7
8	5	5	6	6
7	9	4	9	2
6	7	7	8	6
5	9	11	8	3
4	6	5	6	3
3	6	9	7	3
	42	41	44	23

$X^2 = 9.024$ d.f. = 15 $.90 > p > .75$

TABLE 38A
(III-c-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "PERSONAL ADEQUACY" AND HIGH SCHOOL CLASS RANK

Class Rank (in "stens")	Rank (score) on "Personal Adequacy"			
	4	5	6	7
8	4	5	10	3
7	9	4	7	4
6	9	2	11	6
5	13	5	8	5
4	7	3	8	2
3	6	3	9	7
	48	22	53	27

$X^2 = 9.883$ d.f. = 15 $.90 > p > .70$

TABLE 39A
(III-c-3)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "SKILLS UNIQUE TO THE JOB" AND HIGH SCHOOL CLASS RANK

Class Rank (in "stens")	Rank (score) on "Skills Unique to the Job"			
	4	5	6	7
8	4	6	5	7
7	7	6	7	4
6	7	8	5	8
5	9	9	8	5
4	3	5	9	3
3	9	7	4	5
	39	41	38	32

$X^2 = 10.351$ d.f. = 15 $.90 > p > .75$

TABLE 40A*
(III-c-4)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "OVERALL SATISFACTORINESS" AND HIGH SCHOOL CLASS RANK

Class Rank (in "stens")	Rank (score) on "Overall Satisfactoriness"			
	4	5	6	7
8	4	5	8	5
7	8	5	9	2
6	8	7	5	8
5	12	7	9	3
4	7	5	6	2
3	7	6	7	2
	46	35	44	25

$X^2 = 9.853$ d.f. = 15 $.90 > p > .75$

*Also appears in Chapter IV as Table 34.

TABLE 41A*
(III-c-5)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "COMMUNICATIONS COMPETENCY" AND HIGH SCHOOL GRADE AVERAGE IN ENGLISH COURSES

English Average (in "stens")	Rank (score) on "Communications Competency"			
	4	5	6	7
8	7	4	10	7
7	5	7	5	4
6	8	7	7	4
5	8	9	10	4
4	10	9	5	3
3	4	5	7	1
	42	41	44	23

$X^2 = 9.650$ d.f. = 15 $.90 > p > .75$

*Also appears in Chapter IV as Table 35

TABLE 42A
(III-c-6)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "PERSONAL ADEQUACY" AND HIGH SCHOOL GRADE AVERAGE IN ENGLISH COURSES

English Average (in "stens")	Rank (score) on "Personal Adequacy"			
	4	5	6	7
8	8	5	7	8
7	5	3	11	2
6	9	3	11	3
5	9	6	12	4
4	12	3	5	7
3	5	2	7	3
	48	22	53	27

$X^2 = 13.118$ d.f. = 15 $.75 > p > .50$

TABLE 43A
(III-c-7)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "SKILLS UNIQUE TO THE JOB" AND HIGH SCHOOL GRADE AVERAGE IN ENGLISH COURSES

English Average (in "stens")	Rank (score) on "Skills Unique to the Job"			
	4	5	6	7
8	6	7	5	10
7	6	5	4	6
6	5	9	7	5
5	8	9	11	3
4	11	8	3	5
3	3	3	8	3
	39	41	38	32

$X^2 = 17.796$ d.f. = 15 $.50 > p > .25$

TABLE 44A
(III-c-8)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "OVERALL SATISFACTORINESS" AND HIGH SCHOOL GRADE AVERAGE IN ENGLISH COURSES

English Average (in "stens")	Rank (score) on "Overall Satisfactoriness"			
	4	5	6	7
8	6	4	11	7
7	5	7	7	2
6	9	6	8	3
5	9	7	10	5
4	13	7	2	5
3	4	4	6	3
	46	35	44	25

$X^2 = 14.292$ d.f. = 15 $.75 > p > .50$

TABLE 45A
(III-c-9)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "COMMUNICATIONS COMPETENCY" AND HIGH SCHOOL GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES

Vocationally-Oriented	Rank (score) on "Communications Competency"			
Average (in "stens")	4	5	6	7
8	7	6	2	3
7	5	2	8	3
6	3	8	10	3
5	5	7	6	2
4	5	5	9	1
3	7	4	3	2
	32	32	38	14

$X^2 = 14.548$ d.f. = 15 $.50 > p > .25$

TABLE 46A
(III-c-10)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "PERSONAL ADEQUACY" AND HIGH SCHOOL GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES

Vocationally-Oriented	Rank (score) on "Personal Adequacy"			
Average (in "stens")	4	5	6	7
8	7	3	3	5
7	6	2	7	3
6	4	5	11	4
5	7	3	6	4
4	4	5	9	2
3	7	2	3	4
	35	20	39	22

$X^2 = 11.995$ d.f. = 15 $.75 > p > .50$

TABLE 47A*
(III-c-11)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "SKILLS UNIQUE TO THE JOB" AND HIGH SCHOOL GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES

Vocationally-Oriented Average (in "stens")	Rank (score) on "Skills Unique to the Job"			
	4	5	6	7
8	5	5	4	4
7	6	1	6	5
6	1	11	7	5
5	6	5	5	4
4	3	7	7	3
3	10	2	1	3
	31	31	30	24

$X^2 = 26.112$ d.f. = 15 $.05 > p > .025$

*Also appears in Chapter IV as Table 36.

TABLE 48A
(III-c-12)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "OVERALL SATISFACTORINESS" AND HIGH SCHOOL GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES

Vocationally-Oriented Average (in "stens")	Rank (score) on "Overall Satisfactoriness"			
	4	5	6	7
8	5	6	3	4
7	6	2	7	3
6	2	10	7	5
5	7	3	7	3
4	4	6	9	1
3	8	3	3	2
	32	30	36	18

$X^2 = 18.964$ d.f. = 15 $.25 > p > .10$

TABLE 49A
(III-c-13)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "COMMUNICATIONS COMPETENCY" AND HIGH SCHOOL ATTENDANCE RECORD

Attendance Record (in "stens")	Rank (score) on "Communications Competency"			
	4	5	6	7
8	4	7	11	2
7	8	4	5	2
6	11	4	7	9
5	2	10	11	4
4	6	7	9	2
3	11	9	1	4
	42	41	44	23

$X^2 = 29.443$ d.f. = 15 $.02 > p > .01$

TABLE 50A*
(III-c-14)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "PERSONAL ADEQUACY" AND HIGH SCHOOL ATTENDANCE RECORD

Attendance Record (in "stens")	Rank (score) on "Personal Adequacy"			
	4	5	6	7
8	6	2	14	2
7	10	1	3	5
6	8	4	11	8
5	5	6	11	5
4	6	7	7	4
3	13	2	7	3
	48	22	53	27

$X^2 = 25.472$ d.f. = 15 $.05 > p > .025$

*Also appears in Chapter IV as Table 37.

TABLE 51A
(III-c-15)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "SKILLS UNIQUE TO THE JOB" AND HIGH SCHOOL ATTENDANCE RECORD

Attendance Record (in "stens")	Rank (score) on "Skills Unique to the Job"			
	4	5	6	7
8	4	8	10	2
7	7	2	6	4
6	7	8	7	9
5	2	9	9	7
4	7	8	4	5
3	12	6	2	5
	39	41	38	32

$X^2 = 23.543$ d.f. = 15 $.10 > p > .05$

TABLE 52A*
(III-c-16)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RANK ON "OVERALL SATISFACTORINESS" AND HIGH SCHOOL ATTENDANCE RECORD

Attendance Record (in "stens")	Rank (score) on "Overall Satisfactoriness"			
	4	5	6	7
8	4	7	12	1
7	9	2	3	5
6	9	4	9	9
5	4	10	10	3
4	7	7	7	3
3	13	5	3	4
	46	35	44	25

$X^2 = 29.705$ d.f. = 15 $.02 > p > .01$

*Also appears in Chapter IV as Table 38.

TABLE 53A
(III-d-1)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RATING AS "SATISFACTORY" OR "UNSATISFACTORY" AND HIGH SCHOOL CLASS RANK

Class Rank (in "stens")	Rating	
	Satisfactory	Unsatisfactory
8	18	4
7	18	6
6	21	6
5	19	12
4	14	6
3	17	8
	107	42

$X^2 = 3.591$ d.f. = 5 $.75 > p > .50$

TABLE 54A
(III-d-2)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RATING AS "SATISFACTORY" OR "UNSATISFACTORY" AND HIGH SCHOOL AVERAGE IN ENGLISH COURSES

English Average (in "stens")	Rating	
	Satisfactory	Unsatisfactory
8	21	6
7	18	3
6	17	9
5	22	9
4	17	10
3	12	5
	107	42

$X^2 = 4.078$ d.f. = 5 $.75 > p > .50$

TABLE 55A
(III-d-3)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RATING AS "SATISFACTORY" OR "UNSATISFACTORY" AND HIGH SCHOOL AVERAGE IN VOCATIONALLY-ORIENTED COURSES

Vocationally-Oriented Average (in "stens")	Rating	
	Satisfactory	Unsatisfactory
8	14	4
7	14	4
6	21	3
5	14	6
4	16	4
3	8	8
	87	29

$X^2 = 8.015$ d.f. = 5 $.25 > p > .10$

TABLE 56A*
(III-d-4)

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN EMPLOYER'S RATING AS "SATISFACTORY" OR "UNSATISFACTORY" AND HIGH SCHOOL ATTENDANCE RECORD

Attendance Record (in "stens")	Rating	
	Satisfactory	Unsatisfactory
8	20	3
7	12	7
6	23	8
5	23	4
4	15	9
3	14	11
	107	42

$X^2 = 9.897$ d.f. = 5 $.10 > p > .05$

*Also appears in Chapter IV as Table 39.

TABLE 57A*

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND POSITION OF PERSON WHO DOES THE HIRING

Position of Person Who Does Hiring	Selection Procedures	
	Careful	Careless
Personnel Director	21	15
Owner	8	18
Someone with Divided Duties	19	10
	48	43
$X^2 = 7.387$	d.f. = 2	$.05 > p > .025$

*Also appears in Chapter IV as Table 40.

TABLE 58A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY AND CARELESSLY SELECTED WORKERS AND SCHOOL ATTENDED

School Attended	Selection Procedure	
	Careful	Careless
Urban Vocational	15	10
Urban Comprehensive	15	19
Suburban Comprehensive	18	14
	48	43
$X^2 = 1.701$	d.f. = 2	$.50 > p > .25$

TABLE 59A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY AND CARELESSLY SELECTED WORKERS AND GENERAL OR VOCATIONALLY-ORIENTED PROGRAM

Program Taken in High School	Selection Procedure	
	Careful	Careless
General	14	11
Vocationally-Oriented	34	32
	48	43

$X^2 = .022$ d.f. = 1 $.90 > p > .75$

TABLE 60A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIP BETWEEN CAREFULLY AND CARELESSLY SELECTED WORKERS AND GRADE AVERAGE IN REQUIRED ENGLISH COURSES

English Grades (in "stens")	Selection Procedure	
	Careful	Careless
8	13	9
7	7	3
6	8	6
5	9	12
4	6	9
3	5	4
	48	43

$X^2 = 3.489$ d.f. = 5 $.75 > p > .50$

TABLE 61A*

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND GRADE AVERAGE IN VOCATIONALLY-ORIENTED COURSES

Voc-Oriented Grades (in "stens")	Selection Procedure	
	Careful	Careless
8	13	2
7	2	4
6	7	9
5	4	5
4	6	8
3	3	5
	35	33
$X^2 = 9.830$	d.f. = 5	$.10 > p > .05$

*Also appears in Chapter IV as Table 41.

TABLE 62A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND HIGH SCHOOL ATTENDANCE RECORD

Attendance Record (in "stens")	Selection Procedure	
	Careful	Careless
8	8	7
7	5	8
6	11	13
5	9	6
4	6	6
3	9	3
	48	43
$X^2 = 4.264$	d.f. = 5	$.75 > p > .50$

TABLE 63A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND RANK ON "OVERALL SATISFACTORINESS"

Rank (score) on "Overall Satisfactoriness"	Selection Procedure	
	Careful	Careless
7	7	9
6	14	13
5	12	9
4	15	12
	48	43

$X^2 = 0.777$ d.f. = 3 $.90 > p > .75$

TABLE 64A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND RATING AS "SATISFACTORY" OR "UNSATISFACTORY"

Employer's Rating	Selection Procedure	
	Careful	Careless
Satisfactory	33	31
Unsatisfactory	14	12
	47	43

$X^2 = 0.001$ d.f. = 1 $p < .90$

TABLE 65A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND JOB CONTENT PRIORITY SEQUENCE

Job Content Priority Sequence	Selection Procedure	
	Careful	Careless
C	17	10
Pc	17	15
Ps	9	15
S	5	3
	48	43

$X^2 = 3.676$ d.f. = 3 $.50 > p > .25$

TABLE 66A*

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND DEMANDINGNESS OF JOBS

Demandingness of Job	Selection Procedure	
	Careful	Careless
3 (more)	18	8
2	20	17
1 (less)	10	18
	48	43

$X^2 = 6.119$ d.f. = 2 $.05 > p > .02$

*Also appears in Chapter IV as Table 42.

TABLE 67A*

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CAREFULLY OR CARELESSLY SELECTED WORKERS AND JOBS CLASSIFIED INTO TEN CATEGORIES

Job Categories	Selection Procedure	
	Careful	Careless
Skilled white collar	7	1
Skilled blue collar	5	1
Sales clerk or attendant	3	3
Stock or shipping clerk	14	12
Driving, delivery	2	3
Machine operator	2	5
Assembly, fabrication	5	4
Janitorial	7	2
Food service, public accommodation	1	6
Miscellaneous physical labor	2	6
	48	43

$X^2 = 17.043$ d.f. = 9 $.05 > p > .02$

*Also appears in Chapter IV as Table 43.

TABLE 68A*

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND INTELLIGENCE QUOTIENT

I.Q. (in "stens")	Co-Workers	Principal Subjects
8	33	24
7	9	20
6	9	28
5	13	27
4	11	21
3	14	21
	89	141

$X^2 = 13.692$ d.f. = 5 $.02 > p > .01$

*Also appears in Chapter IV as Table 46.

TABLE 69A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND HIGH SCHOOL ATTENDANCE RECORD

Attendance (in "stens")	Co-Workers	Principal Subjects
8	21	24
7	12	19
6	13	31
5	10	27
4	22	24
3	11	25
	89	150

$X^2 = 7.408$ d.f. = 5 $.25 > p > .10$

TABLE 70A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND THE DAT VERBAL SCALE

DAT Verbal (in "stens")	Co-Workers	Principal Subjects
8	24	29
7	7	16
6	16	25
5	11	27
4	10	20
3	9	20
	77	137

$X^2 = 3.669$ d.f. = 5 $.75 > p > .50$

TABLE 71A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND THE DAT NUMERICAL SCALE

DAT Numerical (in "stens")	Co-Workers	Principal Subjects
8	23	22
7	16	21
6	10	26
5	6	22
4	10	27
3	13	19
	78	137

$X^2 = 10.414$ d.f. = 5 $.10 > p > .05$

TABLE 72A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND THE DAT ABSTRACT SCALE

DAT Abstract (in "stens")	Co-Workers	Principal Subjects
8	20	31
7	11	15
6	16	22
5	9	28
4	16	17
3	6	24
	78	137

$X^2 = 8.998$ d.f. = 5 $.25 > p > .10$

TABLE 73A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND THE DAT SPACE SCALE

DAT Space (in "stens")	Co-Workers	Principal Subjects
8	9	18
7	16	20
6	8	31
5	18	26
4	8	23
3	17	19
	76	137

$X^2 = 10.083$ d.f. = 5 $.10 > p > .05$

TABLE 74A

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND THE DAT MECHANICAL SCALE

DAT Mechanical (in "stens")	Co-Workers	Principal Subjects
8	15	24
7	12	21
6	6	25
5	16	27
4	12	22
3	14	18
	75	137

$X^2 = 4.842$ d.f. = 5 $.50 > p > .25$

TABLE 75A*

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND RANK ON "OVERALL SATISFACTORINESS"

Rank (score) in work group	Co-Worker	Principal Subjects
8	5	2
7	19	23
66	34	44
5	16	35
4	10	41
3	2	5
	86	150

$X^2 = 13.811$ d.f. = 5 $.02 > p > .01$

*Also appears in Chapter IV as Table 45.

TABLE 76A*

OBSERVED FREQUENCIES USED IN TESTING THE RELATIONSHIPS BETWEEN CO-WORKERS AND PRINCIPAL SUBJECTS AND RATING AS "SATISFACTORY OR "UNSATISFACTORY"

Job Success Rating	Co-Workers	Principal Subjects
Satisfactory	81	107
Unsatisfactory	4	42
	85	149

$X^2 = 18.896$ d.f. = 1 $p < .001$

*Also appears in Chapter IV as Table 44.

HIGH SCHOOL: SUBJECT'S NAME:____________________

UV___; UC___; SC___. Home Telephone:____________________

FORM I: INTERVIEW BETWEEN COUNSELOR AND GRADUATE

Note to Counselor: Start interview by referring, as may be the case, to either a prior follow-up done by the school or to a recent phone call to the home. Establish purpose by saying, "We are trying to keep up with changes here at school on how to advise new seniors on getting jobs and also to change some courses so they will learn more things in school to help them do well on their jobs. So we are calling all boys from the 1963 class who are working or have been working this past year, to get your opinions on a few points."

---

1. "Are you working now?" --------------- ___Yes (THEN ASK QUESTIONS A THRU F)
___No (IF NO, SKIP TO ITEM 2,B)

A) "Where do you work, what company?"____________________

B) "Where is that located?" (APPROXIMATE) ____________________

C) "What do you do, what do they call your job?" ____________________

D) "When did you start there, what month?" ____________________

E) "Is this a full time, 40 hour a week job?"------------ ___Yes ___No

F) "Could this be a permanent job if you wanted it to be?"___Yes ___No

---

2. A) (ASK ONLY IF HE STARTED HIS PRESENT JOB SINCE LAST SEPTEMBER--1963):
"Did you have a full time job before the one you have now?" ___Yes ___No
(IF YES, SKIP TO 2,C BELOW. IF NO, STOP AND USE #1, ABOVE)

B) (ASK ONLY IF HE IS NOT WORKING AT THE TIME OF THIS INTERVIEW):
"Did you have a full time job at all since your graduation?"___Yes ___No
(IF YES, THEN CONTINUE. IF NO, THEN CONCLUDE INTERVIEW.)

C) "Where did you work,what company?"____________________

D) "Where is that located?" (APPROXIMATE) ____________________

E) "What did you do, what did they call your job?" ____________________

F) "When did you start there, what month?" ____________________

G) "Was this a full time, 40 hour a week job?" --------------- ___Yes ___No

H) "Could this have been a permanent job if you had wished?"-- ___Yes ___No

---

3. (IF CASE 2,F--ABOVE--SHOWS THERE WAS TIME TO HAVE HAD STILL ANOTHER JOB, LAST ING THREE OR MORE MONTHS, THEN TURN TO BOTTOM OF LAST PAGE WHERE A SPACE IS PROVIDED FOR THIS.)

FORM I: Interview between Counselor and Graduate (cont.)

---

4. A) "Well, let's talk about your job with ______________." (THE ONE SELECTED) "What would you say was the one most important skill you need(ed) on this job?--probably the thing you do that would matter most if you didn't do it right."

   B) "Was your high school education important in helping you do this?__Yes__N
   (IF YES) "How do you feel you have been helped?" (COULD BE COURSES, GUIDANCE, ACTIVITIES)

---

5. A) "Next, what would you say is (was) the one most difficult thing you do (d
   on this job?--probably the skill or operation that was hardest to learn when you first started."

   B) "Was your education important in helping you on this? ___Yes__No
   (IF YES) "How do you feel it was helpful?"

---

6. A) "What part of this job or what thing do (did) you do that takes up (took up) the most time? -- at least on most days?"

   B) "Was your education important in helping you on this part? ___Yes__No
   (IF YES) "How do you feel it was helpful?"

---

7. A) "Do (did) you have to read and write quite a bit on this job?" ___Yes__No
   (IF YES) "In what ways?"

   B) (IF YES FOR A) "Was your high school education helpful for this, or do you feel your grade school education was enough?" ______________________________

   C) (IF HIGH SCHOOL WAS HELPFUL) "In what ways was high school helpful?"

---

8. A) "Do (did) you have to use math or arithmetic on this job?" ___Yes__No
   (IF YES) "In what ways do you use it? (MONEY, MEASUREMENTS, ETC.)

   B) (IF YES FOR A) "Was your high school education helpful for this, or do you feel your grade school education was enough?" ______________________________

   C) (IF HIGH SCHOOL WAS HELPFUL) "In what ways was high school helpful?"

---

9. A) "Do (did) you have to talk to people quite a bit as part of your work?" ___Yes__No
   (DON'T ASK IF OBVIOUS, AS IN CASE OF STORE CLERK OR CARRY OUT BOY)

---

9. (cont.)
B) "In what ways is (was) it important to talk to people on this job?

---

10. "Now, how did you happen to get this job?" Did you know somebody who helped you?" (AS HE TELLS ABOUT THIS, CHECK POINTS BELOW. NAME POSSIBILITIES IF NECESSARY.)

___ Newspaper ad;
___ Employment service;
___ Relative or friend was helpful--How?___________________
___ Someone from school was helpful--Who?___________________
___ Other method. What?___________________________

---

11. "When they hired you, did they say why they chose you instead of someone else?" ___ Yes ___ No
(IF YES) "What reason did they give?"

---

12. "Did they say you had to have a certain kind of training, or have certain courses in high school to be hired for this job?" ___ Yes ___ No
(IF YES) "What training or what courses?"

---

13. A) "Were they looking for someone with experience working on a job something like this?" ---------------------------------- ___ Yes ___ No

B) "Did you have any work experience doing something like this before, either part time or full time? ---------------- ___ Yes ___ No

C) (IF YES IN B) "What jobs have you had before the job we've been talking about?--including part time or summers while still in high school?"
(EXCEPT THOSE LISTED ON PAGE 1 OR 3) Full time: (NAME JOB) ______________________ How long?_____
Part time: ______________________ How long?_____

---

14. "When you first started this job, how did they help you learn what to do?" (DISCUSS BRIEFLY UNTIL IT IS CLEAR WHICH ITEM BELOW COMES CLOSEST TO THE SITUATION. YOU MAY NEED TO CHECK TWO ITEMS. ALSO ASK UNDERLINED QUESTIONS IF THEY APPLY.)

___A) Very little on-the-job training. (SOMEONE JUST TOLD HIM WHAT TO DO AND HE DID IT.)
___B) Assigned to a senior co-worker. (THIS MAY BE A FORMAL APPRENTICESHIP OR JUST "BUDDY" CO-WORKER. STATE WHICH TYPE.) ______________

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14. (cont.)

C) Informal training program. (A FEW MATERIALS TO READ, PERHAPS A FEW LECTURES OR DEMONSTRATIONS. ASK, BELOW, ABOUT TIME AWAY FROM DUTY.)

"How many hours in all did you do this on company time?" (APPROX. HOURS.)____________

D) Formal on-the-job training program, with a schedule of training sessions on company time. (ASK) "How much time was spent at this a week?" ______ "For how many weeks?"____________

---

15. "If we were to send a senior down there next May or June, someone who wanted a job like the one we have been talking about, whom would he ask to see?" ____________________ name or title

A) (IF NAME OR TITLE GIVEN, ASK): "Is this the same person who interviewed and hired you? ___Yes (Go to B) ___No (SKIP TO C)

B) (IF YES in A, ABOVE): "Is he your boss?"------ ___Yes ___No

C) (IF NO IN A, ABOVE): "Then who did hire you?"________________ name and/or title

D) (RE PERSON IN C): "Is he your boss?"---------- ___Yes ___No

E) (IF ANSWER ABOVE IS NO): "Who is your boss, then?"________________ name and/or title

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16. (ASK EVERYONE THIS NEXT QUESTION IMMEDIATELY AFTER GETTING THE NAME OR TITLE OF THE BOY'S BOSS IN B, D, OR E, ABOVE IN #15. WE DON'T WANT HIM TO THINK WE ARE UNUSUALLY INTERESTED IN HIS BOSS, NOR DO WE WANT HIM TO SAY ANYTHING MORE ABOUT HIS BOSS.)

A) "About how many people work for your boss?"-----------__________

B) "How many of these do just about the same kind of work that you do?"____________

C) "Are these mostly young fellows like yourself?"________________

---

17. (CONCLUDE INTERVIEW. SAY SOMETHING LIKE THIS): "Well (BOY'S NAME), that ought to be enough information so we can study your job along with the others. We will end up knowing what kind of work all of you do, and we will know what you and the others feel about your schooling."

17. (cont.)

"Later we are going to ask your employers to fill out a form where they will also tell us what they think the school is doing right and what the school could do better. We won't connect your name with it except that you will be one of the graduates of the high schools they will have in mind when they answer our questions. We won't mention that we have talked with you."

"Thanks very much for your help."

END OF INTERVIEW - POINT BELOW IS FOR OVERFLOW FROM PAGE ONE

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(3) (FROM PAGE ONE--IN CASE SOMEONE HAS HAD MORE THAN TWO JOBS)

A) "Where did you work, what company?"________________________

B) "Where is that located?" (APPROXIMATE)________________________

C) "What did you do there, what do they call your job?"________________________

____

D) "When did you start there, what month?"________________________

"When did you stop?"________________________

E) "Was this a full time, 40 hour a week job? ___Yes ___No

F) "Could this have been a permanent job if you had wished? ___Yes ___No

---

HIGH SCHOOL:
UV___; UC___; SC___.

SUBJECT'S NAME______________

FORM II: DATA FROM SCHOOL RECORDS

___1. Days absent plus days tardy in grades 10 through 12.

___2. Intelligence quotient on group-administered test in grades 6-9.

___3. (a) DAT - Verbal scale ( )
___ (b) " - Numerical scale (Percentile ranks)
___ (c) " - Abstract scale (based on)
___ (d) " - Space scale (national norms)
___ (e) " - Mechanical ( )

___4. Class rank in grade 12 (Percentile rank based on composite marks in grades 10-12)

___5. English grade average (Based on 6 semesters of required English)

___6. Grade average of vocationally-oriented courses (based on up to ten most recent semesters in courses with "vocational intent")

Vocationally-oriented courses taken in grades 10-12

Grade 10	Grade 11	Grade 12

QUESTION: Could this graduate (of UC or SC) compete on a fairly equal basis on a job related to all or part of the above vocationally-oriented training with an otherwise identical boy who had training at the vocational high school?

CHECK ONE: ___Yes; ___No; ___Yes, if some on-the-job training were provide

EDUCATIONAL RESEARCH and DEVELOPMENT COUNCIL
of the Twin Cities Metropolitan Area

COLLEGE OF EDUCATION • UNIVERSITY OF MINNESOTA • MINNEAPOLIS, MINNESOTA

(FORM III, Part A)

(The inside address and salutation were typed personally to each employer. The body of the letter was individually typed by automatic typewriter.)

We were given your name in a telephone inquiry as the person to contact for obtaining authorization to interview one or two employees of your company.

What we seek, specifically, is a few minutes of time for a brief interview with you or with a person you designate, plus another brief interview with a supervisor in your organization (this may be the same person, or yourself, if you would indicate this). A research project endorsed by our Council is being conducted by Howard E. Bergstrom, who is a school administrator engaged in conducting this study. Mr. Bergstrom will be contacting you in a few days by telephone, and will arrange with you a convenient time for these interviews.

The enclosed page describes the purpose and the method of the study. In short, we want to gain from both employers and young workers some information which will help improve vocational training and vocational counseling in high schools. We are confident that you will want to work with us toward this goal.

You will note from the letterhead that this study is endorsed by the Minneapolis Public Schools and the St. Paul Public Schools, as well as by the suburban districts listed on this page. Findings of this study, along with other studies being conducted, will be made known to school officials and will be helpful to them in improving the education of young workers you employ in the future.

Mr. Bergstrom will answer any questions you may have when he telephones your office.

Sincerely yours,

Donald E. Davis
Executive Secretary

DED:paw
enclosures

FORM III, Part B

MEMORANDUM ACCOMPANYING THE LETTER TO EMPLOYERS

EDUCATIONAL RESEARCH AND DEVELOPMENT COUNCIL OF THE TWIN CITIES METROPOLITAN AREA

TO: Employers selected for interviews in the study of entry-level jobs

FROM: Howard E. Bergstrom, Director of the study

SUBJECT: Questions that employers will probably want answered with the answers

What is the purpose of the study?

The schools want to get the opinions of both a sample of young male workers and their supervisors as to what schools might do better in the future to prepare young workers to succeed on their jobs. This information may be used to recommend changes in training program and in the vocational guidance provided in high schools.

Just who is being studied?

We are interested in getting information about young male workers (ages 18, 19, or 20, approximately), who graduated from or at least attended a high school in the Twin Cities area. (We will not study all of these intensively, of course, but statistical sampling methods will be used to identify representative groupings after the total group is identified.) We are, at thi time, studying only those who go to work directly after high school, who do nc take any additional training.

How did you (the employer) get selected as one of the employers who would be involved in this study?

We started with the lists of graduates from the high schools, and took a sampling of them. Then we contacted these graduates to find out where they work. You are, or have been in recent years, the employer of at least a few of these graduates. In this way we have obtained a sample of employers who actually employ boys directly out of high school. Of course, some employ many and others employ very few.

Just who is to be interviewed?

First, we will telephone your office to find out whom we should dea with in the next step. We will first want to talk with someone who has the names of past or present workers who fit the job description(s) listed for you company. Next, we will wish to talk with the person who is the supervisor of the group of young men who work under this specific job description. This should be the person of highest authority who still knows the workers quite well as individuals.

FORM III, Part B (cont.)

What questions will be asked in the interview?

In the first interview mentioned above (in some places of employment the same person may supply both interviews) the job description will be confirmed or corrected. Then, the qualifications for hiring and the metho of breaking in new workers will be asked about. Third, the names of past and present workers will be listed. In the second interview, with the supervisor of the workers, the workers will be discussed on four points. In both interviews, suggestions to the schools for making improvements will be encouraged and recorded.

Who will see the information given in the interviews?

The director of the study will be the only person who will ever see the information in a form where names of workers or employers are identifiabl He is pledged to transcribe it into summary form for analysis on a computer, so that what emerges for wider distribution will not identify either workers or employers.

FORM IV: INTERVIEW WITH EMPLOYER

Part A--Background Information, plus "Demandingness"[1]

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1. BASIC DATA

Date____________________

Company____ (1)

Address____ (2)

Personnel Director__________________________________ (3)

Job Boss____ (4)

Total Employed by Company____________________________ (5)

Number in this job def._______________________________ (6)

Number working for this boss in this job_________________ (7)

Number of above 1 to 3 years out of high school___________ (8)

---

2. DESCRIPTION OF THE JOB IN QUESTION

What operation takes up the most time?____________________ (1)

What part of this job is most important--that is, makes the most difference when it is done wrong?____________ (2)

What part of this job seems to be the hardest for beginners to learn (anything from getting to work on time to some complex task)?____________________ (3)

---

3. RECRUITMENT FOR THE JOB

IN HIRING THE YOUNG WORKERS INDICATED IN #8 IN PART A, WHICH OF THE FOLLOWING WAS THE METHOD USED IN MOST CASES?

An employment agency sent applicants._____________________ (1)

We ran ads in the newspapers.___________________________ (2)

---

[1] The interviewer filled out the blanks, while he and the employer each had a copy to aid their discussion.

FORM IV, Part A - Background Information, plus "Demandingness" (contd.)

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3. (cont.)

We asked the high school office or certain teachers to suggest some. ________________________________ (3)

Our own employees encouraged friends or relatives to come in and apply.________________________________ (4)

Other method (name it)________________________________ (5)

---

4. CRITERIA IN SELECTION

Please number the items below according to which is the most important, which is second most important, etc., in choosing the young workers indicated in #8 or Part A.

Had completed certain vocational courses in school that we want for this job. __________ (1)

Got high scores in the rest of tests which we give candidates for this job. __________ (2)

He made a good impression in the interview (made us think he could do it). __________ (3)

We contacted his high school and they gave him a good recommendation. __________ (4)

He had some prior experience at this. __________ (5)

---

5. ON-THE-TRAINING FOR THIS JOB

WHICH ONE OF THE FOLLOWING STATEMENTS COMES CLOSEST TO THE WAY THAT YOUNG WORKERS WITHOUT EXPERIENCE ARE GIVEN ON-THE-JOB TRAINING FOR THIS PARTICULAR JOB?

We tell him what to do, put him to work, watch him, and correct him where wrong. ("line" supervision) __________ (1)

We assign him to one of the experienced men, to work as a sort of assistant for awhile. (How long?______ weeks) __________ (2)

---

5. (contd.)

We have a regular, standard way of breaking in new men--they take material home to read, they see demonstrations, etc., but very little company time is spent on this.______ (3)

We have regular, formal on-the-job training, and ______ hours of company time a week, for _____ weeks, is allowed. ______ (4)

---

6. SKILL AND OTHER REQUIREMENTS

CHOOSE ONE OF THE FOUR ITEMS BELOW FOR THIS PARTICULAR JOB, ACCORDING TO WHICH COMES THE CLOSEST TO DEFINING IT CORRECTLY (add oral illustration).

This is a tough job to fill for a boy just out of high school--he not only has to have high skills of specific kinds but he has to be dependable and quick to learn._____ ( )

The boy doesn't have to have much special training other than a high school education, but he has to be dependable and quick to learn.______________________________ ( )

Most high school graduates can learn to handle this job if they are honest and willing, but it does take quite awhile to learn the operations if they haven't learned them in school.______________________________ ( )

Almost any boy can handle this job if he is honest and willing, and he can pick up all of the essential operations in a few days.______________________________ ( )

FORM IV: INTERVIEW WITH EMPLOYERS

Part B--Criteria Cards and Name Slips for Ranking

Card 1

C C

COMMUNICATIONS COMPETENCY

Reading instructions and following them;

Writing records, receipts, reports, etc.;

Following instructions given orally;

Talking with customers or co-workers as a necessary part of the job;

Recording and using numbers (here considered to be a part of language or communications) as in making change. taking measurements. etc.

Card 2

P P

PERSONAL ADEQUACY

Gets to work on time, hardly ever absent;

Works to the best of his ability;

Honest, and is loyal to his employer;

Gets along well with other workers;

Personal qualities needed for the particular job.

Card 3

S S

SKILLS UNIQUE TO THE JOB

Things everyone has to know how to do to hold this job;

Operations or skills the worker has to learn either in school (vocational training) or otherwise time has to be spent to teach him on the job.

Card 4

T T

OVERALL SATISFACTORINESS

All factors combined, including some points not included on the other three cards;

Also, indicate where dividing point is between those you would willingly rehire and the others (oral illustration).

FORM IV, Part B - Criteria Cards and Name Slips (contd.)

Name Slip[1]

Name ______________________________

Job ______________________________

Eval. as of (date) ________________

Started ____________ Left __________

to go to __________________

High School __________ Year __________

No. in wk. gp. ______

Job-content factors

			T	S
				U

---

[1] A name slip was made out for each member of the group to be ranked. (Some were eliminated as more information disqualified them.) The letters C, P, and S were written in the top squares as the employer indicated the order of their importance. Then the ranks were written in the bottom squares as they were made, ending in "T" (for "Total", or "Overall"), and the "S" or "U" was checked.